



II. READINESS

These graduates leave USUHS trained to provide continuity in ensuring medical readiness and the preservation of lessons learned during combat and casualty care. This critical role is, in fact, the significant factor that led the Congress to establish USUHS in 1972.

- Congressional Record, Tribute to Val G. Hemming, M.D., **The Honorable Paul S. Sarbanes, the United States Senate**, May 17, 2002, page S4533.

The Graduate School of Nursing (GSN) is successfully preparing unique advanced practice nurses to deliver care for the Uniformed Services during disaster relief and humanitarian interventions and, by doing so, ensures military readiness.

- Congressional Record, Tribute to Dr. Faye Glenn Abdellah, **The Honorable Daniel K. Inouye, the United States Senate**, May 16, 2002, pages S4488-S4489.

These USUHS alumni serve in critical roles that are vital to the readiness mission of the Military Health System (MHS). The extraordinary retention of these military officers ensures continuity for the MHS and the safeguarding of lessons learned during combat and casualty care. Currently, USUHS School of Medicine alumni represent over twenty-one percent of the total physicians on active duty in the military services. Furthermore, a significant number of USUHS graduates who have completed their residency training hold leadership or operational positions throughout the MHS.

- **Vice Admiral Michael L. Cowan, Surgeon General of the Navy**, Testimony before the House Armed Services Committee, Subcommittee on Military Personnel, April 10, 2002, page 20.

USUHS has integrated WMD-related education and training throughout its standard SOM curricula; in addition, following the terrorist attacks of September 11, 2001, USUHS has continued the development of exportable packages for distance learning for the medical response to WMD and has been designated in HR3254 to share its unique expertise with the Department of Veterans Affairs (VA) to assist the VA health care professionals in preparing to respond to WMD-related incidents.

- Resolution Number 71, The Eighty-Fourth National Convention of **The American Legion**, August 27-29, 2002.

The Uniformed Services University of the Health Science (USUHS) is recognized by the Association of American Medical Colleges (AAMC) as “the one place where physicians of tomorrow do get thorough preparation to deal with the medical aspects of chemical and biological terrorism. USUHS Students learn how nuclear, biological, and chemical agents act on the human body and what to do in the event of a suspected exposure.”

- AAMC Reporter, December issues of 1998 and 2001.

USUHS medical support teams responded to the attack (on September 11, 2001) at the World Trade Center and supported Federal law enforcement agencies for several weeks. The USUHS Center for the Study of Traumatic Stress provided consultation to many institutions and physicians, while the Armed Forces Radiobiology Research Institute (AFRRI) at USUHS assisted in developing decontamination methodologies for the U.S. Postal Service in the wake of the anthrax attacks.

- **USU Board of Regents**, Report to the Secretary of Defense, June 1, 2002, page 2.

The combination of DoD’s expertise in the field treating casualties from unconventional attacks and the VA infrastructure of medical centers, clinics, satellite broadcast capabilities and affiliations with medical schools will enable U.S. medical professionals to become knowledgeable and medically competent in dealing with future attacks. Content for the training sessions would be based on programs established at the USUHS School of Medicine, the nation’s only federal medical school. Sometimes referred to as the “West Point for Doctors,” USUHS offers an education in military medicine, preparing graduates to handle “real world scenarios that most doctors are ill-equipped to face. Students would learn how biochemical and radiological agents act on the human body and how to handle a suspected exposure - from the point of detection through to decontamination and medical countermeasures,” according to information from Congressman Buyer’s office.

- Washington Fax, “VA bills would offer treatment, research and physician training to fight chemical, biological and radiological attacks,” April 9, 2002.

The Nation's only military medical school dedicated to the provision of uniformed physicians, advanced practice nurses, and scientists who will ensure readiness, retention, force health protection, the medical response to natural and man-made disasters and weapons of mass destruction (WMD), and medical support during humanitarian missions.

- Resolution Number 71, The Eighty-Fourth Convention of **The American Legion**, August 27-29, 2002.

The terrorist attack on September 2001 reconfirmed that not all serious injuries are physical in nature. The effects of traumatic stress on individuals, organizations, communities, and nations are of substantial concern in the current world climate. Mental health has become a national security issue. The USUHS Center for the Study of Traumatic Stress provides an integrative and comprehensive approach to an understanding of the biomedical, psychosocial and public policy effects of trauma and disaster on individuals and communities. Robert J. Ursano, M.D., Professor and Chairman, Department of Psychiatry and Director, USUHS Center for the Study of Traumatic Stress, along with members of his staff, distilled key points for widely distributed fact sheets (throughout the MHS and civilian medical communities) targeting topics related to the terrorist attacks. In recognition of his national and international stature (with the media and academia), Dr. Ursano was an invited participant on the Department of Defense Terrorism Task Force, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) Panel on Planning for Bioterrorism, and the World Psychiatric Association Symposium on Disaster and Terrorism.

- USU Board of Regents, Report to the Secretary of Defense, June 1, 2002, page 3; Appendix A, page 3.



II. THE F. EDWARD HÉBERT SCHOOL OF MEDICINE

Content for the training sessions would be based on programs established at the USUHS School of Medicine, the Nation's only Federal medical school. Sometimes referred to as the "West Point for Doctors," USUHS offers an education in military medicine, preparing graduates to handle "real world scenarios that most doctors are ill-equipped to face. Students would learn how biochemical and radiological agents act on the human body and how to handle a suspected exposure - from the point of detection through to decontamination and medical countermeasures," according to information from Congressman Buyer's office (Congressman Steve Buyer, Chairman, Subcommittee on Health, House Veterans Affairs Committee).

- The Washington Fax, "VA Bills Would Offer Treatment, Research and Physician Training to Fight Chemical, Biological and Radiological Attacks," April 9, 2002.

ESTABLISHMENT

Background. From 1945 to 1950, there was an acute deficit of medical experience resulting from the rapid downsizing after World War II. The loss of physicians was so acute, and retention so poor, that the Army and Navy medical departments began residency programs as a recruitment and retention device. In 1950, the physician shortages forced the involuntary recall of reservists and also forced the retention of those eligible to retire.

After the Korean War, the United States, for the first time in peacetime, maintained large, active-duty military forces through conscription and allocated significant resources to build and maintain a world-wide military presence. The medical departments of the Army, Navy, and Air Force participated in this expansion and relied on conscription. During this time, over 90 percent of all graduating physicians and dentists served on active duty for an average of two years.

During the conflict in Vietnam, from 1964 to 1972, medical support of a sophisticated nature was deployed in fixed facility hospitals with staff and equipment equal to those of academic medical centers in America. The helicopter essentially replaced the motor ambulance for evacuation; and, air evacuation to the United States became routine. Capitalizing on the lessons learned in past wars, preventive medicine kept the infectious disease and non-effectiveness (*inability of the forces to participate in combat activities*) rates at the lowest levels of any war, while rapid evacuation and advanced surgery reduced the died-of-wounds rate.

The Uniformed Services Health Professions Revitalization Act of 1972, Public Law 92-426. The conscription of physicians, which began in 1950, ended in 1973 when the draft law was repealed. In anticipation of this, a military medical school (USUHS) and a scholarship program (HPSP) in civilian medical schools were established by Congress in 1972 to provide physicians for the Armed Forces. The Uniformed Services Health Professions Revitalization Act of 1972, Public Law 92-426, established the HPSP Program to be a flexible source for the quantity of physicians required by the Armed Forces; USUHS was established to provide a cadre of military medical officers who would serve as career officers, providing continuity and leadership for the Military Health System.

USU's First Academic Program. The F. Edward Hébert School of Medicine was established by Congress as part of Public Law 92-426 in 1972, with its first class graduating in 1980. The early development of the University concentrated on USU's first academic program, the School of Medicine. **Anthony R. Curreri, M.D.,** was appointed as the University's first President in 1974; **Jay P. Sanford, M.D,** joined **Doctor Curreri,** at the USU President's request, and was later appointed as Dean, SOM, in May of 1975. He served as Dean through 1990. The initial development of objectives for the SOM was accomplished through the combined efforts of the Board of Regents (BOR), the BOR Educational Affairs Committee, Doctor Curreri, Doctor Sanford, and special working groups. Activities used to develop these objectives included committee meetings, retreats, and consultation with a variety of experts from military medicine and civilian medical organizations and institutions. Individuals and groups consulted included: the Surgeons General of the Army, Navy and Air Force; Chiefs of the Medical Departments/Services of the Army, Navy, and Air Force; physicians from the Walter Reed Army Medical Center, the National Naval Medical Center at Bethesda, the Malcolm Grow Air Force Medical Center at Andrews Air Force Base, the Wilford Hall United States Air Force Medical Center, the United States Army Academy of Health Sciences, Sheppard Air Force Base Academy of Health Sciences, Brooke Army Medical Center, and the Armed Forces Institute of Pathology; the Secretary of the Air Force; the Secretary of the Navy; the Association of American Medical Colleges (AAMC); the American Medical Association (AMA); the Liaison Committee on Medical Education (LCME); the Department of Health, Education, and Welfare; the National Institutes of Health (NIH); George Washington University; Georgetown University; and, Howard University.

MISSION

The USUHS shall: 4.1. Educate and train competent medical personnel qualified to serve the needs of the Uniformed Services through providing the highest quality education programs in the health sciences; 4.2. Place high priority on educating and training personnel to meet the combat and peacetime medical needs of the Armed Forces; and, 4.3. Grant applicable advanced academic degrees; establish postdoctoral and postgraduate programs, and technological institutes; conduct medical readiness training and continuing education for members of the Uniformed Services in the health professions; and prepare individuals for careers in the health professions in the Uniformed Services.

- DoD Directive 5105.45, signed by **The Honorable John J. Hamre, Deputy Secretary of Defense**, dated March 9, 2000, page 2.

Consistent Mission Direction Focused on Readiness. USU has a thirty-year history of guiding statements, mission direction, goals and tasking documents from the Congress, the Executive Office of the President, and the Department of Defense. From the words of the School of Medicine's "Founding Father," **Congressman F. Edward Hébert**, ... as he described how he first envisioned the University during the 1947 timeframe:

The mission of USUHS is to produce...dedicated young officers who...will be able to mobilize and deploy rapidly...to meet military and civilian crises...The University will provide opportunities for aspiring young military officers to attain academic recognition..." (the Life and Times of Congressman F. Edward Hébert, 1976, page 408)

to the 1999 mission statement quoted above from the Department of Defense... the goals of the USU SOM have remained consistent. The USU SOM must provide: 1) a cadre of career-oriented physician officers who will provide leadership and continuity for Uniformed medicine; 2) unique training in combat medical care, trauma, mass casualties, the response to weapons of mass destruction, medical logistics, and rapid deployment; 3) joint training in a multi-Service environment; and, 4) the opportunity for health care professionals throughout the MHS to attain academic recognition.

Strategic Planning. A formal process of strategic planning was initiated, in 1991, to set priorities for the University. The process was conducted by an executive steering committee chaired by the USU President and included representation from the entire USU community. Mission and vision statements and guiding principles were completed in early 1992. Since that time, specific goals, strategies, and objectives have been established for the University, to include metrics for achieving those goals.

The SOM community has been actively involved in the development of the USU Strategic Plan, participating in the initial strategic planning training sessions during 1991, the finalization of objectives and metrics during 1999 and 2000, and the strategic planning sessions held during April of 2001 and December of 2002. This multi-year process has included institutional retreats, town meetings, departmental briefings, and printed and electronic updates as a means of communicating with the SOM faculty and staff.

To ensure that the SOM's future direction is consistent with the Military Health System, the SOM strategic planning process is guided by the current strategies and goals of the Military Health System, which reflect the strategic planning policies and guidance established by the Office of the Assistant Secretary of Defense for Health Affairs. The SOM Departments must show a direct relationship with USU's overall Strategic Plan when submitting their requests for future budgets. A formal process for identifying program needs and for submitting increased budget requests tied to the Strategic Plan has been established. A School of Medicine Strategic Plan has been written and has undergone review by the Basic Science Chairs Committee, the Clinical Science Chairs Committee, and the Faculty Senate.

Internal and External Departmental Review Process. A program was adopted by the School of Medicine in 1998, which mandated each SOM department to conduct a "self-study" every five years or at the time of the appointment of a new chairperson. The self-study would be followed with a review of the self-study by a group of "peers" from outside of the University. From 1999 through 2002, self-studies and external reviews have been completed by the Departments of Anesthesiology, Dermatology, Family Medicine, Military and Emergency Medicine, Obstetrics and Gynecology, Pharmacology, Neurology, Radiology and Radiological Sciences, and Surgery. Other departmental reviews pending completion include: Anatomy, Physiology and Genetics; Pathology; Pediatrics; and, Medical History. The results of these studies will be used to chart future courses for these departments in education, research, and community service.

Mission Accomplishment...SOM Graduates Provide Continuity and Leadership for Military Medicine.

Retention of SOM Alumni and Unique Training Ensures Continuity for Lessons Learned in Military Medicine.

The extraordinary retention of these military officers (USUHS alumni) ensures continuity for the MHS and the safeguarding of lessons learned during combat and casualty care... Furthermore, a significant number of USUHS graduates who have completed their residency training hold leadership or operational positions throughout the MHS... We place great emphasis on the retention of quality physicians in the military.

- **Testimony by the Surgeon General of the Navy, Vice Admiral Michael L. Cowan, before the House Armed Services Committee, Subcommittee on Military Personnel, April 10, 2002.**

I believe our opponents don't understand our business... they say medical care, and they envision peace time medical care as the only business we are in. In fact, we have two broad categories of business. One is called readiness. The other is called the peace time benefit.

USUHS, is the best investment in readiness medicine that we can make, (it) provides a tremendous baseline for us. We train our uniformed services graduates in the benefit missions through residencies, but they (USUHS graduates) have a foundation in readiness that we cannot get anyplace else. We don't practice medicine in the military. We practice military medicine.

- **Testimony by the Surgeon General of the Air Force, Lieutenant General Paul K. Carlton, Jr., before the Senate Appropriations Committee, Subcommittee on Defense, February 28, 2001.**

In Vietnam... I had no military training prior to coming in. It was a very challenging, difficult experience... when I got there I learned how to take care of Marines myself. I was alone. There was no place to med-evac patients, so through the night I had to keep casualties alive until we could move them during the daylight...

The emotional experience of a young doctor who does not have the right kind of training in these kind of things has driven me to where I am today.

My whole life since that time has been dedicated to try to prepare people for combat, and USUHS has been able to train these young physicians to be far more ready than I was. They are superb in

medicine. The training that USUHS provides is far more than just the medical training. What we have here is the ability to train Army, Navy and Air Force and Public Health Service physicians from day one to work together in a joint environment. They go and they jump out of airplanes with the Army, they go with us to the Marine Corps, they go with us aboard ships at sea, and they go to the air. They do all these things together... from day one... so they develop a joint mentality that has a value of which you cannot quantify the cost of. So, when the time came for me to select a doctor who was going to go on the Joint Task Force for Somalia, I chose a USUHS teacher, ...one who had been there, who spoke the language, who was able to do joint planning and to effectively bring the troops to Somalia. You cannot cost that out...the value of having people with this kind of training is really irreplaceable. There are many, many, many courses and experiences at USUHS that are just not duplicatable. It is a national resource. They come as leaders...they are dedicated to stay with us for a long time... We want experienced people to stay in the military... Now that we have USUHS, we cannot give that up.

- Testimony by the **Surgeon General of the Navy, Vice Admiral Donald F. Hagen**, before the Senate Armed Services Committee, March 2, 1994, pages 35-37.

USU SOM Alumni Represent 21.2 Percent of the Total Active Duty Physicians in the Army, Navy, and the Air Force. Since its first graduation in 1980, through April of 2002, USU has granted 3,268 medical degrees; 2,620 of those graduates remain on active duty in the Uniformed Services: Army - 1,016; Navy - 748; Air Force - 762; USPHS - 94. The active duty physician force in the MHS currently totals approximately 11,907 physicians (Army - 4,189; Navy - 4,023; Air Force - 3,695); the 2,526 USU SOM Graduates on active duty in the Army, Navy, and Air Force represent 21.2 percent of those 11,907 physicians. The early founders had hoped that the USU graduates would equal at least 10 percent of the total physician force; the USUHS SOM has exceeded that original milestone. USU has steadily provided an excellent source of career-minded physicians who are uniquely skilled in the practice of military medicine.

USU SOM Alumni Provide Overall Retention Rates of 83.6 percent Over 23 Years. Where Congress had envisioned a retention rate close to 70 percent, the overall retention rate for USU SOM graduates from its first graduating class in 1980 through the present, is 83.6 percent; of the ten USU SOM classes which graduated between 1990 and 1999, the retention rate is 95.3 percent. These retention rates become even more significant in light of the recruitment and retention concerns currently reported by the Armed Forces. In addition, the USU SOM graduates over 97 percent of those who matriculate.

SOM Graduates Present Clinical Skills Required for MHS Residency Programs.

I echo the assessment of USUHS provided by the Secretary of Defense on March 22, 2001: “The training USUHS students receive in combat and peacetime health care is essential to providing

superior force health protection... USUHS is a unique national asset and a vital integrated part of the Military Health System.

- Testimony by the **Surgeon General of the Navy, Vice Admiral Michael L. Cowan**, before the House Armed Services Committee, Subcommittee on Military Personnel, April 10, 2002.

The system in place for the documentation of the comparability of clinical educational experiences is an outstanding model for other institutions to emulate.

- Letter to USUHS, Liaison Committee on Medical Education (LCME), dated April 6, 2002.

Senator, the three of us (Surgeons General) make up the Executive Board for the Uniformed Services University of the Health Sciences (USUHS), and we have a direct impact on the university...over the last eight years, as I have commanded a major medical center and also as the Surgeon General, I have learned of the quality of the product of USUHS and the focus that USUHS has on military medicine and the importance (of USUHS) to the Surgeons General. I would be hard put to be without the graduates of USUHS.

- Testimony by the **Surgeon General of the Navy, Vice Admiral Richard A. Nelson**, before the Senate Appropriations Committee, Subcommittee on Defense, on February 28, 2001.

USUHS is a dramatic difference in depth and degree and experience and exposure and immersion in what we call military medicine, that is not available in the civilian community. My experience has been we have uniformly superior products in the (USUHS graduates). I happened to be stationed on an Army post before I came here, with a small clinic run by a young doctor. I saw the difference between his predecessor and himself, the USUHS graduate. He hit the ground running and turned the clinic around in just a few short weeks. It made a lasting impression on me.... From the clinics to the largest Air Force hospital in this country, Wilford Hall, USUHS graduates excel... A third of the USUHS graduates at Wilford Hall are in positions of high responsibility for their grade...I like what I see.

- Testimony by the **Surgeon General of the Air Force, Lieutenant General Alexander M. Sloan**, before the Senate Armed Services Committee, March 2, 1994, page 37.

2002 AAMC Medical School Graduation Questionnaire Results Validate that USU Graduates Are Highly Satisfied with their Medical Education. Evidence of the high quality of training that SOM students have received comes from many sources. For example, each academic year, the Association of American Medical Colleges (AAMC), with the assistance of medical school administrators, conducts a survey of graduating seniors at medical schools throughout the United States. Students are asked to rate statements that cover their entire medical school experience. Included among the numerous topics surveyed are premedical preparation, pre-clinical education, clinical experiences, student services and the overall quality of the medical education received. In September of 2002, the USU Office of Student Affairs reported that the ratings of the Year 2002 Medical School Graduation Questionnaire show a consistently strong, positive evaluation by USU students at a level well above the all-schools comparison. For example, 81.5 percent of the USU SOM seniors strongly agreed with the statement, "Overall, I am satisfied with my medical education." Whereas, when averaging the replies from all responding medical schools in the United States, only 34.8 percent rated the statement as "Strongly Agree."

2002 Joint Service Graduate Medical Education Selection Board Results - 90 Percent Receive First Choice in Specialty. Traditionally, more than 75 percent of USU SOM graduates receive their first choice of specialty and location for their first year of residency training. In December of 2002, the Office of Student Affairs reported that the results of the 2002 Joint Service Graduate Medical Education (GME) Selection Board for the USUHS SOM Class of 2003 were favorable. The overall selection rate for FIRST CHOICE programs was 74 percent; 114 out of 155 USU students matched for their first choice both in specialty and training site. Twenty-five additional students received their first choice in specialty for a resulting 90 percent who received their first choice in specialty. Feedback obtained from residency program directors indicates that SOM graduates are consistently recognized as well-prepared to complete graduate medical training.

USU Students Pass the 2002 United States Medical Licensing Examination Step 2 at a Rate of 96 Percent. In addition, USU students have consistently passed the United States Medical Licensing Examination (USMLE) Steps 1 and 2 at rates higher than the national average. In 1999, the National Board of Medical Examiners (NBME) began computer-based testing (CBT) for the USMLE Step 1 and 2 Examinations. The Step Examinations are administered at Prometric Testing Centers throughout the calendar year. Most of the USU fourth-year students (SOM Class of 2003) completed the Step 2 CBT between July and September of 2002. The overall performance for the Class of 2003 was strong; the average performance for the class was 209 and the pass rate was 96 percent. The variability in scores has increased with the new CBT; this would be expected given the reduction in the number of questions and the introduction of a new testing format.

Operational Assignments, Leadership Positions, and Unique Understanding of Military Medicine Are Substantiated.

These USUHS alumni serve in critical roles that are vital to the readiness mission of the Military Health System (MHS). The extraordinary retention of these military officers ensures continuity for the MHS and the safeguarding of lessons learned during combat and casualty care. Currently, USUHS School of Medicine alumni represent over twenty-one percent of the total physicians on

active duty in the military services. Furthermore, a significant number of USUHS graduates who have completed their residency training hold leadership or operational positions throughout the MHS.

- Testimony by **Vice Admiral Michael L. Cowan, Surgeon General of the Navy**, before the House Armed Services Committee, Subcommittee on Military Personnel, on April 10, 2002.

Our Uniformed Services University of the Health Sciences has robust and long-standing educational programs in the medical aspects of biological and chemical terrorism developed for our military medical and graduate students. The University is now actively involved in adapting these programs to the civilian medical education community in both traditional and interactive web-based formats. The University works closely with other federal agencies, the private sector, and the American Association of Medical Colleges and the American Medical Association to accomplish these important and timely educational goals.

- Testimony by **The Honorable William Winkenwerder, Jr., M.D., Assistant Secretary of Defense for Health Affairs**, before the House Committee on Government Reform, Subcommittee on National Security, Veterans' Affairs, and International Relations, on November 7, 2001.

As for recruiting, we have some of the best programs in the world. The young men and women who are coming out of the Uniformed Services University of the Health Sciences are absolutely superb!

- **Surgeon General of the Army, Lieutenant General James B. Peake**, Military Medical Technology, Volume 4, Issue 6, 2000, page 18.

Do I value USUHS? ...I value it a great deal and (consider that) it is a major asset to this country. I do value the output. I can tell you that in the Army we have a deficit of training in the type of individuals who can go into combat with a battalion...and I do get complaints from line officers that we very frequently have physicians in there who are not ready for that. That is never the case when a USUHS graduate fills that bill.

- Testimony by the **Surgeon General of the Army, Lieutenant General Alcide M. LaNoue**, before the Senate Armed Services Committee, March 2, 1994, page 35.

USU SOM Alumni Hold Significant Leadership and Operational Positions Throughout the MHS.

The highly dedicated USU graduates are earning promotions at above average rates; they have become well-respected in their medical specialties, and hold significant positions of leadership in areas of military medicine ranging from special operations and hospitals, to the White House and the newly established Department of Homeland Security, to deployments to Kosova and Iraq, and to assignments aboard ships at sea and with the Blue Angels. SOM alumni are engaged in patient care or research in military hospitals and clinics around the world, administering to active duty members, retirees, and their family members. These military physicians and the thousands of other health professionals who have taken advantage of the numerous graduate and continuing education programs provided by the SOM, are living testimony to USU's mission as the Nation's Federal Health Sciences University.

Review Documents USU SOM Alumni Meet the Special Needs of the MHS. Following an inclusive review in 1995, the General Accounting Office (GAO) confirmed that **“43 out of 44 commanders of major military medical units perceived that physicians from the University have a greater overall understanding of the military, greater commitment to the military, better preparation for operational assignments, and better preparation for leadership roles.”** The GAO reviewers also pointed out that they **“perceive that University graduates have a better appreciation of and greater satisfaction with the physician's role within the military”** than other accession sources (General Accounting Office Report, “Military Physicians - DoD's Medical School and Scholarship Program,” September 29, 1995, page 43). Recent congressional testimony by the Surgeons General reflect that these significant findings have been substantiated over the past eight years.

USU SOM Alumni Hold a Significant Percentage of Leadership and Operational Positions in the MHS. A review completed in January of 1998, documented that of the approximately 1,431 USU graduates on active duty who were eligible to hold leadership positions, and were not in a post graduate educational status, 292 were serving as chairs, chiefs or heads of departments, directors of services, or program directors in military hospitals, clinics or centers. An additional 60 USU alumni were serving in operational assignments for the three military services. These 352 USU physician alumni were holding significant leadership and/or operational positions throughout the Military Health System (MHS). Another review conducted in February of 1999, documented that of the first six classes of USU graduates, from 1980 through 1985, 408 alumni remain on active duty; 170 of whom (approximately 42 percent) hold senior operational or leadership positions. In April of 2003, a preliminary review has shown that over 50 of the most significant Command Positions in the MHS are held by USU graduates.

The USU SOM Selection Process Ensures Commitment and Exemplary Retention Rates.

Medical Students represent every state in the union and other locations where American citizenship is granted. Selection of students has been through a well orchestrated administrative and committee process that is regularly reviewed each year. We are seeking the customary bright individual with an array of non-cognitive endowments that matter to the profession of medicine, and matter to one's identity as a commissioned military officer. In this regard, we select individuals whom we

believe are gifted in leadership, self reflection, naturally engaging, adaptable and demonstrate evidence of placing service to others as a priority.

- *V. Students*, Subcommittee Report, Middle States Association of Colleges and Schools (MSA) Self Study, USU Web Site, dated February 5, 2003, page 3.

It is important to maintain a sense of continuity by remaining committed to the traditions, core values, and justifiable pride that are part of military medicine. Leaders organize, challenge others, provide the resources, and create the environment for others to achieve goals and accomplish remarkable feats... They make us believe in the nobility of a cause. The integrity and strength of character of the leader results in loyalty and devotion on the part of those who follow. It is the job of a teacher to keep bringing us back to certain basic principles. It is the moral obligation of the teacher to know his or her students, to recognize their individual needs, and to provide information, guidance, and encouragement during the learning process. The future of the medical departments appears bright when considering the quality of applicants seeking admission to the School of Medicine at USUHS. As a group, they have impressive credentials. Their application essays reflect a bright, highly motivated, and service-oriented cadre.

- **RADM Donald L. Sturtz, MC, USN, (Retired), Professor, Department of Surgery, USU School of Medicine, "Commitment," Military Medicine, Volume 166, September 2001, pages 741-742.**

High ethical standards, the candidate's own 'internal moral compass,' compassion, honesty, and integrity should be emphasized in the selection process for candidates to become the nation's physicians... Selection should employ MCAT scores and GPAs not as predictors of success in medical school, but as threshold measures to indicate only that applicants possess the intellectual endowment and scholastic aptitude needed to meet the academic rigors. Once candidates have satisfied those threshold requirements, we should give no further weight to academic credentials but make selections on the basis of character traits and aptitude for serving others.

- **Jordon Cohen, M.D., President, Association of American Medical Colleges (AAMC), in his opening speech at the 108th annual meeting of the AAMC, on November 6, 1997.**

The USU SOM Selection Process Withstands the Test of Time. The USU SOM selection process has been identified as one of the major factors in the success of the overall retention rates of the USU alumni. All candidates are carefully screened during the interview process to determine the following: 1) already recognized sensitivity for national, public, and/or community service, which clearly has the potential for enhancement in

Federal service; 2) the presence of natural and adaptable leadership skills already documented in a variety of organizations and circumstances; 3) an enthusiasm for supportive care-giving directed at individuals and groups, forming the basis for involvement as a physician in the broad areas of medicine, and military medicine in particular; and, 4) a documented record of academic success, which extends beyond the boundaries of any standard curriculum, as demonstrated through individual creativity, service, and/or research. A Matriculating Student Survey conducted by the Association of American Medical Colleges (AAMC) showed that compared to the national group of matriculants, USU SOM candidates were more likely to select medicine as a career because of the opportunity to serve the community and to lead, and less likely to seek a medical career for purposes of prestige or high income.

The SOM Committee on Admissions, faculty and student interviewers, and the SOM Office of Admissions work together to manage and implement the SOM Selection Process. The Committee on Admissions is comprised of men, women, active duty, civilian, clinical science, basic science, minority, and faculty representation for a total of 25 individuals. The applicant review process operates at subcommittee and full committee levels, with the initial review focusing on Medical College Admission Test (MCAT) scores and grade point averages (GPAs). The secondary review process is designed to enhance the opportunity for inviting applicants to interview. Candidates with academic records which would ordinarily preclude regular review at the subcommittee level and those not initially invited for interview are reviewed by the Assistant Dean for Admissions and Academic Support. This allows the identification of candidates who may have been overlooked and supports the SOM effort to recruit active duty military applicants, disadvantaged individuals and underrepresented minorities. Folders of all interviewed applicants are reviewed by three separate subcommittee members and are presented for full committee review if ranked above the minimum threshold. However, appropriate consideration is extended to underrepresented minority and active duty military applicants ranked at lower levels, and these candidates are also presented to the full committee. In addition, individual committee members may bring the application of any interviewed candidate to the attention of the full committee independent of the subcommittee ranking.

The “interview day” is consistently reported as a positive experience by applicants; during the interview process, the applicants take part in various activities, to include: organized briefings; two formal interviews; lunch; a tour of the campus with students; and, informal visits with: the Associate Dean for Student Affairs; the Assistant Dean for Clinical Sciences; the Director, Office of Admissions; the Assistant Dean for Admissions and Academic Records; the Vice President for University Recruitment and Diversity Affairs; faculty members; and, the SOM Commandant. Applicants are also given the opportunity to stay overnight with a student host. The selection process has continuously brought to the SOM a group of students who are academically qualified and well-motivated to practice medicine. In the history of the medical school, only two percent of the student body has had to be disenrolled for academic reasons; this is about one-third of the national average. The excellent percentage of students graduating (over 97 percent) is due to: 1) a good selection process; 2) a solid educational program; and, 3) genuine concern for those students who require academic or personal assistance during their time at USU.

ACCREDITATION

At its meeting on April 3-4, 2002, the Liaison Committee on Medical Education (LCME) reviewed and accepted with appreciation your progress report on the documentation of the comparability of clinical educational experiences across clerkship sites. The system in place for documentation of the comparability of clinical educational experiences is an outstanding model for other institutions to emulate. Your next full accreditation survey is currently scheduled for the 2006-2007 Academic Year.

- Letter from the Liaison Committee on Medical Education to the Dean, School of Medicine, dated April 6, 2002.

Early Coordination with the Liaison Committee on Medical Education. The developmental process for establishing the initial objectives of the SOM were accomplished through the combined efforts of the founding USU President, **Anthony R. Curreri, M.D.**, the Board of Regents (BOR), the Dean, **Jay P. Sanford, M.D.**, and, special working groups. Activities used to develop these objectives included committee meetings, retreats, and consultation with a variety of experts from military medicine and civilian medical organizations and institutions. Significant among those coordinating entities was the Liaison Committee on Medical Education (LCME).

SOM Program Accreditation.

Background. The LCME accreditation process is designed to certify that a medical program meets prescribed standards; and, by awarding accreditation, the LCME indicates confidence in the quality of the medical school program. The accreditation process also fosters institutional and program improvement. The SOM received provisional accreditation from the LCME, a joint activity of the Association of American Colleges (AACJC) and the Council on Medical Education of the American Medical Association (AMA) in 1976. The SOM was fully accredited by the LCME in 1979, and has continuously maintained that status.

The SOM prepared a Self-Study during 1992 and was visited by an LCME survey team during January 11-14, 1993. On April 7, 1993, the LCME voted to continue full accreditation for seven years. The Dean was asked to submit a report to the LCME by January 1, 1995, addressing: 1) progress in curriculum reform, including decompression in the first two years; 2) the empowerment and role of the curriculum committee to review, evaluate, design, and manage the curriculum; 3) the status of filling chairs of academic departments, with special reference to the availability of space and financial resources to do so and to the energizing of education and research; and, 4) the appropriateness of enrollment size and the adequacy of clinical resources. Following the LCME request, an ongoing curriculum renewal process was initiated in June of 1993. In November of 1993, the Dean's Policy Memorandum regarding the structure and function of the curriculum committee was updated to

assign responsibility to the curriculum committee in accordance with the LCME's guidance as described in Functions and Structure of a Medical School. Search committees were appointed to fill the open department chair positions. And, plans were initiated to develop third-year clerkship rotations at two additional sites. A report, submitted in December of 1994, detailed the status of progress in the four areas identified by the 1993 LCME response. The LCME accepted the report in February of 1995; and, it requested an additional report by September 1, 1996, to address the following: 1) any changes in class size stemming from the downsizing of the Uniformed Services; 2) the status of continued Federal support; 3) further progress in curricular management, evaluation, and reform; and, 4) the system and results of monitoring the equivalency of educational quality and the evaluation of students across sites of clinical education. The response, dated August 16, 1996, indicated that the class size had not been affected by the downsizing of the Uniformed Services and that Federal funding was sufficient to support the University's programs. Also, for the 1996-97 Academic Year, an additional ten percent reduction in contact hours for first and second-year students was implemented, resulting in an additional afternoon per week of student study time. In September of 1996, the LCME accepted that report; and, no further information was requested prior to the full accreditation survey scheduled for the 1999-2000 Academic Year.

LCME Self-Study and Site Visit - 1999. Following accreditation by the LCME in April of 1993, the LCME scheduled its next review of the SOM Program for reaccreditation in November of 1999. As a precursor to that review, the Associate Dean for Medical Education coordinated an institutional Self-Study. Self-Study Committees were established during 1998, assigned topic areas, and charged to review and analyze portions of the Medical Education Database as well as other information considered relevant to their topic areas. Reports were then submitted to the Steering Committee on February 1, 1999; all reports were reviewed by both the Steering Committee and a larger LCME Task Force. All data, Self-Study reports, and the Executive Summary were submitted to the Dean during the Summer of 1999. Following the Dean's review, those materials were submitted for review to the LCME and the Survey Team Members some months prior to the Survey Team Visit. The Site Visit took place between November 14-18, 1999. Exit briefings and follow-up correspondence from the LCME suggested a successful visit and continued accreditation. Official notice from the LCME was provided on April 13, 2000: "The School of Medicine received continued full accreditation of the educational program leading to the MD degree for a seven-year term. The next full survey will take place during the 2006-2007 academic year" (Letter from the LCME to the USU President, dated April 13, 2000).

Excerpts from the Summary of the LCME Full Accreditation Report as Provided in the USU Board of Regents 2000 Report to the Secretary of Defense.

There is ample evidence that a large number of faculty and staff members had taken the self-study seriously and participated fully in the preparation of the report, which was thorough and showed meticulous attention to detail. In reaching its decision to continue full accreditation of the medical school, the LCME identified numerous institutional strengths:

1. The School of Medicine is very successful in meeting its mission in graduating physicians who are well prepared and committed to military medicine;

2. The Dean holds a deep commitment to the values and success of the School of Medicine. He is a strong, capable leader who has been critically important in helping the school fulfill its mission;
3. The clinical curriculum is delivered in excellent military medical facilities, both locally and nationally;
4. The Department of Internal Medicine is to be commended for its success in creating a uniformly excellent clinical clerkship, comparable in quality across multiple educational sites;
5. The students are bright, academically talented, and uniformly dedicated to careers in military public service. They are consistently positive in their views toward their school and its faculty;
6. The support services provided by the Student Affairs Office are exceptional and appreciated by the students;
7. The faculty is available, interested and committed to student instruction and supervision. They work in a collegial fashion on behalf of the School of Medicine and the students; and,
8. The library, computer services, and the new simulation center are state-of-the-art, meeting the educational demands of the students for the future.

2002 Progress Report Receives Commendations from the LCME. In its correspondence dated April 13, 2000, the LCME requested that the Dean of the SOM submit a progress report by March 1, 2002, addressing the following items: documentation of the comparability of clinical experiences across clerkship sites; planning and documentation of resources to support ongoing curriculum design and oversight and enhanced centralized faculty control and management of the curriculum; and, planning for facility improvements for research and education, including progress in addressing the limitations in research laboratory space, office space, and adequate space for small group instruction in the first two years.

The Dean of the SOM began initiatives to enable a timely response to the LCME's request for a progress report. In late April of 2000, the Dean met with the Curriculum Committee and charged its members to develop a plan to further enhance the process of curriculum oversight and management. This new plan was implemented at the beginning of the 2000-2001 Academic Year. The Associate Dean for Clinical Affairs was directed to develop a plan for documenting comparability of clinical experiences across clerkship sites. This task was accomplished in conjunction with the SOM clinical department chairs and hospital-based faculty. The SOM Space Review Committee developed and implemented processes for the review and assessment of space utilization. Baseline data was reviewed and recommendations were provided to improve assignment and utilization of existing space. This process, together with the additional use of 20,000 square feet of laboratory space on the grounds of the National Naval Medical Center and the addition of an approved construction project (41,055 square feet) in the Medical Military Construction Program for Fiscal Year 2006, demonstrated the SOM's progress in addressing space utilization concerns. On February 25, 2002, the USU SOM provided its progress report to the LCME. On April 6, 2002, the Dean, SOM, received notice from the LCME that it had "reviewed and accepted with appreciation the progress report on documentation of the comparability of clinical educational experiences across clerkship

sites, planning and documentation of resources to support curriculum design oversight, enhanced centralized faculty control, management of the curriculum, and planning for facility improvements for research and education.” The LCME informed USU that the next full accreditation survey is scheduled for the 2006-2007 Academic Year.

Additional Accrediting Entities Provide Quality Assurance. In addition to the University’s accreditation by the Commission on Higher Education of the Middle States Association of Colleges and Schools and the SOM’s accreditation by the LCME, the following professional organizations continue to authorize accreditation for the various programs and activities of the SOM: 1) the Accreditation Council for Continuing Medical Education; 2) the Council on Education for Public Health; and, 3) the American Psychological Association Committee on Accreditation. Also, SOM Steering Committees are actively involved with the accreditation process for two additional areas of responsibility reviewed by: 4) the American Association for the Accreditation of Laboratory Animal Care; and, 5) the Nuclear Regulatory Commission.

MILITARY UNIQUE CURRICULUM

Recent tragic events and the current Global War on Terrorism clearly show the benefits of preparedness and training. It is gratifying to know USUHS is leading the way in preparing military health care professionals to meet current and future challenges. Please accept my appreciation and pass on a hearty “Well Done!” to your colleagues and the students for their dedicated efforts in support of our men and women in uniform.

- General Richard B. Myers, Chairman of the Joint Chiefs of Staff, Letter to USUHS, March 29, 2002.

Each of our 3,268 physician graduates has received in-depth instruction in recognition, diagnosis, management, and decontamination for casualties from weapons of mass destruction (WMD). Since its inception in 1972, USUHS has attracted researchers and educators who are focused on these critical issues. WMD education is integrated into our undergraduate medical curriculum through didactic classroom/laboratory instruction and relevant field exercises. To our knowledge, we are the only medical school in the United States to provide such material. Further, the University conducts a well-recognized graduate level course entitled “The Scientific, Domestic and International Policy Challenges of Weapons of Mass Destruction and Terror.” This unique course incorporates a simulated terrorist attack... for students to gain familiarity with unusual events.

- USU Board of Regents, Report to the Secretary of Defense, dated June 1, 2002, page 2.

General Overview. The School of Medicine is a fully accredited medical institution, which provides a year-round, four-year curriculum. This curriculum is 174 weeks in length, approximately 20 weeks longer than the average curriculum of medical schools in the United States. This expanded curriculum focuses on epidemiology, health promotion, disease prevention, tropical medicine, leadership, officership, the management of combat trauma, and combat casualty field exercises. Woven throughout the students’ entire course of study, these and other subjects focus directly on the unique requirements of career-oriented military physicians. The USU SOM military unique training includes “**approximately between 784 and 889 hours of initial military education and medical readiness training compared to that provided to the Health Professions Scholarship graduates whose training ranges from 50 to 132 hours, depending on the Service**” (General Accounting Office Report, “Military Physicians - DoD’s Medical School and Scholarship Program,” September 29, 1995, page 41).

USU Represents a Total Military Medical Educational Environment and Acculturation Process. The USU SOM provides the Military Health System (MHS) with career-oriented medical officers who possess the knowledge, skills, and attitudes essential for effective deployment during joint service operations. The SOM’s principal focus is on military medicine, which involves the prevention of disease and injury; the management of combat trauma; health promotion; and, diagnosis and treatment by medical personnel who are integral to the

military operations they support. This focus also involves the syndromes and injuries, which are either rare or unknown among non-military populations. Military medicine requires a solid background in tropical medicine and hygiene, parasitology, and the use of epidemiologic methods and preventive medicine. **The SOM, for example, provides its medical students with approximately 130 hours of study in these areas, compared to about 13 hours found in the typical civilian medical school curriculum.** Additional knowledge in such areas as military medical intelligence, psychologic stresses of combat and trauma, the medical effects of nuclear, chemical, and biological weapons, and the medical effects of extreme environments - aerospace, undersea, tropical or desert conditions - is essential to a physician's ability to properly support his/her military commander's responsibility for troop fitness. Also critical to a military physician's focus is his or her ability to provide disease prevention and health promotion under austere conditions.

First-Year Curriculum.

Background. Four SOM Departments, Military and Emergency Medicine, Preventive Medicine and Biometrics, Medical History, and Psychiatry, share the major responsibility at USU for teaching the military unique course material, material not found in the curriculum of any other medical school in the United States. In addition to the usual first-year medical school courses, such as Anatomy, Physiology, Biochemistry and Human Behavior, students at the SOM have required courses in Military Studies, Military Medical History, Tropical Medicine (Diagnostic Parasitology and Medical Zoology), as well as Biostatistics and Epidemiology, all of which utilize military data and case studies. This provides an introduction to the scope and content of military medicine and exposes each student to all of the medical systems within the Uniformed Services. Students are focused on the delivery of preventive and treatment services in the “field” or in a deployed environment.

Overview of Military Studies. The Department of Military and Emergency Medicine is responsible for teaching the Military Studies Curriculum during the first and second years of medical school. The first course occurs during the Fall of the first year and is entitled, *Overview of Military Medicine*; it introduces the students to military medicine through lectures and small group discussions. The content of the course includes the expectations that line officers have placed on the medical corps, the distribution and classification of combat casualties, the impact of disease and non-battle injuries on readiness, and the career patterns of the military medical officer. The remainder of this course deals with the echelon system and evolving modular concepts of battlefield health care and an introduction to the areas of chemical, biological, radiological, nuclear, and high explosive (CBRNE) warfare. During the second instructional period (Winter) of the first year, the students learn the basic skills of prehospital care in a course entitled, *Combat Medical Skills*. This portion of the curriculum exposes the students to the level of medical training of the basic medic and introduces, at an early time, those skills which must be built upon and expanded during subsequent medical training. *Military Applied Physiology* is presented during the third instructional period (Spring) of the first year. While this course parallels the traditional Physiology Course, it also reinforces the concept that was introduced during the Fall, that military medicine is a form of occupational/environmental medicine. The physiologic responses to stressors common to the military environment such as cold, heat, radiation, dysbarism, altitude sickness, and exercise are presented in the context of their impact upon readiness.

By the end of the first academic year, each student has completed course work and experiences considerably greater than those required by the Basic Medical Officer Course for any of the Uniformed Services. The first academic year spans 40 weeks of instruction within the SOM, one week of operational medicine, and five weeks of military medical field studies.

Operation Kerkesner.

I just returned from a ‘fantastic’ morning at Quantico observing Operation Kerkesner. I had no idea that the training had reached such a high state of sophistication... Some of my observations included the following: how integrated and well thought out the sequence and content of the

training was; how those students with prior military time helped the uninitiated ones so well; how professional and competent the Marine NCO cadre was. What a powerful lesson for those students to see how the NCO Corps truly is the backbone of the force; how impressed the two Thai Army officers and Japanese Naval officer were as they observed the training. USUHS no doubt is the global benchmark model; how the students praised this experience. Not one I spoke with had a negative thing to say.

- From a Letter to the USU President dated June 25, 1999, from **Colonel Frederick J. Erdtmann, MC, USA, Hospital Commander, Walter Reed Army Medical Center.**

Between the first and second year, all students participate in the required five-week course, *Military Medical Field Studies* (MMFS). The MMFS Course begins with instruction in military field skills: operating a radio, navigating the land in daylight and at night, using preventive medicine principles, and protecting oneself against CBRNE attacks. The knowledge from this block of instruction prepares the students to successfully complete a one-week leadership laboratory exercise at the Quantico Marine Corps Base. This exercise, *Operation Kerkesner* (named after a former Marine faculty member of USU), challenges the students' ability to overcome field problems through their own initiative and team work. The field exercise focuses on small unit operations in a field environment. The class of 165 students is divided into four platoons, which are further divided into eight person squads. Evaluators from the Department of Military and Emergency Medicine and platoon advisors from USU and Quantico live with the students and accompany them in all scenarios. Student leadership is rotated to place each student in a leadership position at squad or platoon level with all attendant responsibilities. The schedule includes operational scenarios that emphasize virtually all major points covered in the Military Studies I Course. Student leaders must know the medical threats (e.g., dehydration, insect-borne disease, sanitation, injury prevention, CBRNE avoidance and decontamination, physical and psychological stress) they may face and demonstrate how they would control these medical problems in their units. This course initiates the student to the field skills and small unit leadership experience required for the successful completion of Operation Bushmaster during the Military Contingency Medicine Course in the fourth year. Operation Kerkesner has been visited by a variety of active and reserve United States military medical personnel and has served as a model for the Navy's Rapid Deployment Medical Force (RADMF) training program. Elements of the course have been used in Public Health Service Disaster Medical Assistance Team (DMAT) training. Foreign military medical personnel have also attended the course to gain material to enhance their own training programs (e.g., the United Kingdom, France, Israel, Japan, Singapore, Thailand, and Mexico).

Non-Medical Operational Assignments. The field exercise is followed by the final portion of Military Medical Field Studies. During this time, prior service students may elect to participate in research, work with a mentor, or attend a military qualification school such as: Basic Airborne Training; Basic Air Assault School; Survival, Evasion, Resistance, and Escape (SERE) School Training; Underwater Operations (SCUBA); or, Expert Field Medical Badge (EFMB). Those students without prior service experience are required to spend four weeks with an operational unit in their parent Service. Students may be afloat on a Navy ship, with a Marine Battalion, with noncommissioned officers (NCOs), or with other junior officers learning the military occupational environment and developing a non-medical perspective on military medicine. Coordinators at each site report on the students' performance to the Department of Military and Emergency Medicine; and, each student produces a daily log and

a written report detailing his/her experience and lessons learned. During this same period, twenty-five to thirty-five percent of each class will elect and successfully complete, one of the military qualification schools listed above.

Special Programs in Operational Medicine Offered by the Casualty Care Research Center. The Casualty Care Research Center (CCRC) is a division of the SOM Department of Military and Emergency Medicine. The CCRC, created in July of 1989, is staffed by military and civilian physicians and scientists. The center provides USU medical students and other medical personnel disciplined training and research experiences in combat casualty care, medical counterterrorism, injury epidemiology, trauma management and other related areas. USU's medical students attend the CCRC programs either as an elective during their fourth year or as part of their summer experience between the first and second years of medical school.

During 2002, approximately 18 students between their first and second year of medical school, selected an area of interest and worked with CCRC faculty members on individualized courses of research and study. The students were also divided into groups; each group was responsible for completing a research effort and for a presentation of findings. Students attended one or more of the following CCRC training opportunities:

1. ***Emergency Medical Technician-Tactical (EMT-T) Course.*** The EMT-T Course was developed to provide relevant training to medical providers who work within the law enforcement special operations community. Topics in the EMT-T Program include: clandestine drug laboratory raids; emergency medical care in barricade situations; care under fire; forensic science during patient care; medical operations, planning and medical intelligence; wounding effects of weapons and booby traps; special medical gear for tactical operations; personal protective gear; special needs for extended operations; preventive medicine; and, injury control;

2. ***Emergency Medical Technician - Tactical Advanced Course.*** The Tactical Advanced Course includes the following topics: advanced technology applications in the remote assessment methodology; legal concepts and moot court; individual health care concepts; concepts in crisis intervention; sleep/wake cycle management; emerging issues in chemical restraint; operational dermatology; management of training injuries; nutrition and fitness for tactical teams; and, less lethal weapons systems; and,

3. ***Weapons of Mass Destruction (WMD) Training Program.*** The Center offers a variety of training programs in the area of WMD to include: Out-of-Hospital Response Training; and, a Health Care Facilities Course. Topics of instruction include: identifying potential chemical-biological-radiological-nuclear (CBRN) devices; threat recognition and evaluation; formulating a building response/evacuation plan; the role of quarantine and isolating exposed individuals; psychological effects of a WMD incident; and, principles of hasty decontamination.

Second-Year Curriculum.

Extensive Hours of Preventive Medicine Training. During the second year, besides Pathology, Microbiology, Pharmacology, Ethics, Human Behavior, Introduction to Clinical Medicine and Physical Diagnosis, students have additional hours of preventive medicine, including an introduction to operational (field) preventive medicine; health promotion in the military; physical fitness programs, policies, and implementation strategies; environmental and occupational health; and, health services administration. On October 3, 2001, the Dean, SOM, issued a revised policy directing that *all second-year medical students must certify as Basic Life Support (BLS) providers at the "C" level.* The certification is in effect for two years and is provided during the sophomore year to maintain certification through May of the senior year. The Department of Military and Emergency Medicine schedules BLS certification sessions for the second-year students; students may elect to certify through officially approved off-campus courses under the auspices of the American Heart Association or the American Red Cross. These courses must be at the "C" level, also known as the health care provider level; students must be certified prior to the beginning of their third-year clerkships.

Military Studies. The second-year *Course in Military Studies*, conducted by the Department of Military and Emergency Medicine, focuses on two general areas: the science base for the practice of military medicine (wound ballistics, extensive background on conventional and unconventional weapons effects, protective equipment, and decontamination procedures) and the command-and-staff functions of military medicine in Joint Commands (medical planning, medical logistics, medical evacuation systems, and blood programs). The second academic year spans 35 weeks of instruction within the SOM. After final examinations, students prepare for the United States Medical Licensing Examination (USMLE) Step 1, which is the first of three examinations in the process of becoming a licensed physician. The current second-year class completed the computer-based testing (CBT) for the USMLE, Step 1, between May and June of 2002, prior to beginning the first rotation of their third year. The Office of Student Affairs reported that 90.1 percent of the USU students in the Class of 2004 passed the examination on their first attempt. The national average percentage pass for 2002 was 90 percent.

Second-Year Medical Ethics Course. The second year, Medical Ethics Course: *Ethical, Legal and Social Issues in Medicine* was initiated during the Summer of 1977. The course, taken by all medical students, provides extensive material directly related to military medicine including the special concerns with sending soldiers back to combat, treatment of prisoners and civilians, and limitations imposed by the Geneva Conventions. A new issue posed this year was whether treatment of prisoners who had been terrorists should be any different from that of prisoners who had been former enemy soldiers fighting for countries that had signed the Geneva Convention. Other material stresses the resolution of hospital-based ethical problems in Federal institutions. A wide range of speakers is annually provided during the course: **Gordon Livingston**, a local psychiatrist and West Point Graduate, shares lessons learned during the Vietnam Conflict; and, **Craig Llewellyn**, Professor and Director, Center for Humanitarian and Assistance Medicine (CDHAM), USU SOM Department of Military and Emergency Medicine, summarizes the discussions by suggesting what the students should retain from the differing views presented on military medical ethics. There are four major issues that all USU students address: 1) Military Medical Triage. The students learn that the practice of military medical triage sometimes departs from traditional civilian medical procedures and that the top priority may be to further the military mission. The students discuss how the varying priorities may be necessary to save extensive lives, both military and civilian; 2)

Captured Enemy Service Persons. The USU students learn that if the captured enemy is ill or injured, he/she is to be regarded as a patient. There is no option for physicians or any service persons to mistreat prisoners or to treat them “less equally” for revenge or military gain; 3) Exploitation of Vulnerable Patients. In this session, the students learn that in medicine, physicians should never exploit vulnerable patients for military gain; and, 4) Self-Incriminating Information. In this final area, students are instructed that the two primary tasks of military physicians are to keep their patients healthy and to provide commanders with accurate information regarding the health of their patients. Over 150 faculty from USUHS, NNMC, and WRAMC led discussions on these and other issues with small groups of students. The final lecture, during both 1999 and 2000, was given by **Patricia Heberer**, an historian at the Holocaust Museum. In this year’s session, the students viewed a film actually shown to the German public by the Nazi Government during World War II to justify policies of euthanasia for selected patient groups such as those who had severe mental illness. The students also learned that all physicians are susceptible to immoral behavior and that they must avoid the mistakes of the past.

Third-Year Curriculum.

Overview. The third-year curriculum consists of clerkships in the principal specialties of medicine. Much of the instruction is provided by uniformed clinical faculty with an emphasis on teaching the special military relevance of the various clinical experiences. Of special note are the military clinical settings for instruction (military tertiary medical centers, military community hospitals, military outpatient ambulatory care clinics, and troop dispensaries on active military bases) and the patient population, which includes active duty personnel presenting diseases and injuries incurred during both training and combat deployments.

As a part of their training and work during their clerkships, USU SOM third (and fourth-year students) provide hundreds of thousands of hours of patient care related services in the MHS hospitals during each calendar year. Such services include: examination of patients; providing post-operative care; organization and maintenance of the completion of the medical history and physical examinations of patients; assistance at surgery and the delivery of newborns; and, updating progress notes in patient records. These services, performed by USU medical students in a supervised setting, provide necessary and important support in the provision of quality medical care to the men, women, and children receiving treatment throughout the MHS.

All SOM departments are providing a clinical experience within the ambulatory setting. The ambulatory services of all departments have grown significantly within the past seven years. The Department of Medicine has taken the lead and devoted extensive resources to the planning, development, and implementation of a comprehensive ambulatory teaching experience. The department's program and its faculty have become nationally recognized for accomplishments in this area; and, a number of publications in peer-reviewed journals and presentations have resulted.

Clerkships Represent the Entire Spectrum of the MHS. USU medical students complete their third and fourth-year clinical clerkships at over 22 military hospitals, representing the entire spectrum of the Military Health System (MHS). The third-year class of approximately 165 students has eight required clinical clerkship rotations of six weeks each, for a total of 1,320 third-year rotations: Family Practice (six weeks); Obstetrics/Gynecology (six weeks); Pediatrics (six weeks); Psychiatry (six weeks); Internal Medicine (two six-week sessions); and, Surgery (two six-week sessions). Five of the USU SOM academic departments - Medicine, Surgery, Obstetrics and Gynecology, Pediatrics, and Psychiatry - use the Walter Reed Army Medical Center and the National Naval Medical Center as major clinical instructional sites.

The University regularly reevaluates and updates the affiliation agreements with its major teaching affiliates, which has improved the relationship between the SOM and its numerous clinical sites; it also ensures that clear routes of communication exist and areas of mutual interest are appropriately defined and addressed. The SOM Associate Dean for Clinical Affairs provides oversight for relationships and interactions between the SOM and its clinical teaching sites. Issues of concern from all parties can now be readily addressed as changes in the military health care delivery system are put into place.

The following teaching hospitals have affiliation agreements with the USU SOM: 1) **United States Army - (6)** Walter Reed Army Medical Center, Washington, D.C.; Brooke Army Medical Center, San Antonio, Texas; Tripler Army Medical Center, Hawaii; Madigan Army Medical Center, Tacoma, Washington; Eisenhower

Army Medical Center, Fort Gordon, Georgia; William Beaumont Army Medical Center, El Paso, Texas; 2) **United States Navy - (3)** National Naval Medical Center, Bethesda, Maryland; Naval Hospital, Portsmouth, Virginia; Naval Hospital, San Diego, California; and, 3) **United States Air Force - (6)** Malcolm Grow Medical Center, Andrews Air Force Base, Maryland; Wilford Hall Medical Center, Lackland, Texas; USAF Medical Center, Wright Patterson Air Force Base, Ohio; USAF Medical Center, Keesler Air Force Base; David Grant Medical Center, Travis Air Force Base, California; and, USAF 3rd Medical Group Regional Hospital, Elmendorf, Alaska. In addition, USU students rotate through the following Medical Centers or Community Hospitals for at least one of their required specialty clerkships: 1) **United States Army - (4)** DeWitt Army Community Hospital, Fort Belvoir, Virginia; Martin Army Community Hospital, Fort Benning, Georgia; Darnall Army Community Hospital, Fort Hood, Texas; Womack Army Community Hospital, Fort Bragg, North Carolina; 2) **United States Navy - (2)** Naval Hospital, Jacksonville, Florida; Naval Hospital, Pensacola, Florida; and, 3) **United States Air Force - (1)** USAF 96th Medical Group Hospital, Eglin Air Force Base, Florida.

The Department of Obstetrics and Gynecology Successfully Utilizes Standardized Patients to Assure Mastery of Required Knowledge, Skills, and Professional Behaviors. Educators in Obstetrics and Gynecology and accreditation bodies have been concerned that a medical student may complete a required core clinical clerkship without the assurance of the mastery of essential clinical skills or the demonstration of the essential components of professionalism. The SOM Department of Obstetrics and Gynecology initiated a program of assessment utilizing standardized patients (trained actor-patients) in an Objective Structured Clinical Exam (OSCE) format with one-on-one faculty supervision at the end of each core six-week clinical clerkship. These sessions are conducted at USU's Medical Simulation Center for clerkships in the National Capital Area; and, sessions are provided in the Obstetrics and Gynecology Clinics located at the integrated Wilford Hall USAF Medical Center in Lackland, Texas; the Brooke Army Medical Center in San Antonio, Texas; and, at the Tripler Army Medical Center in Hawaii. As other clinical programs have done, the Department can now assure that the students have been observed correctly performing techniques. The following procedures are performed utilizing standardized patients during the OSCE: the clinical breast examination; the speculum pelvic examination; the bimanual pelvic examination; an interview of the adolescent gynecologic patient; and, an interview of the menopausal patient. Another innovation, initiated during 2001-2002, was the provision of direct, on-the-spot feedback to the medical students from the standardized patients and the faculty supervisors both at the conclusion of each of the essential techniques, or procedures, listed above, and following the final examination sessions. The standardized patients and faculty reinforce the skills and also provide guidance for improvement. Feedback from the students has been extremely positive; they understand the importance of being able to exhibit the required skills and behaviors; and, they particularly appreciate the immediate guidance and the opportunity to improve their performance of these essential skills. As a consequence, this clerkship experience leaves a permanent impression on the students, which eventually benefits their future patients in subsequent clinical encounters.

An Innovative Clinical Clerkship Management Tool Utilizing Palm-Type, Hand-Held Computer Devices. The Department of Obstetrics and Gynecology has also led the development and implementation of an innovative clinical clerkship management tool utilizing palm-type, hand-held computer devices for medical student performance evaluations. From 2000 through 2002, the residents in the USU, NNMC, and WRAMC-sponsored Uniformed Services Residency in Obstetrics and Gynecology Program have utilized a hand-held device operating system application, which was developed by faculty in the USU Department to establish a cumulative data base

encompassing the residents' individual patient care management experiences. On a weekly basis, each resident downloads his or her data to the main department computer through a "HotSync" function. This allows the program director to have timely, on-going access to the experiences of all of the residents. The positive impact of this program was published in the peer-reviewed premier journal, Obstetrics and Gynecology, and was showcased in a special session at the Annual Meeting of the Council on Resident Education in Obstetrics and Gynecology in March of 2001. Since the residents are the primary teaching interface with the USU medical students, a new program has been developed in the SOM Department so that the residents can enter their assessments of the performance of the USU medical students who are rotating on their respective services. When the residents download their own patient care experiences on a weekly basis, their evaluations of the USU medical students are automatically downloaded as well. The Clinical Clerkship Director then has ready access to the progress of all of the medical students in a format, which is automatically updated each week. As the program is further developed, it will be implemented at all clerkship sites. Data for all students in the Department of Obstetrics and Gynecology is downloaded weekly through a secure Internet site so that the Clerkship Coordinator can monitor the progress of all students at all sites. This process helped USU to meet the LCME requirements for uniform experience and assessment for all USU medical students across all sites.

The Department of Obstetrics and Gynecology Implements the Use of a Life-Sized Birth Simulator. During 2002, the Department of Obstetrics and Gynecology implemented the use of a life-sized birth simulator in the education of USU medical students and residents in the Uniformed Services Residency in Obstetrics and Gynecology. The simulator is located in a dedicated, mock-up delivery room in the Department's Education Unit, which is located in Building 1 at the National Naval Medical Center. **Lieutenant Colonel Andrew Satin, USAF, MC**, Professor of Obstetrics and Gynecology, Head of the Education Division, Department of Obstetrics and Gynecology, USU SOM, and Residency Program Director, and **Lieutenant Colonel Christian Macedonia, MC, USA**, Assistant Professor of Obstetrics and Gynecology, designed a curriculum employing the use of the birth simulator in the instruction of medical students during their core third-year clerkship experiences. Divided into small groups, the students each have an opportunity, under direct faculty supervision, to conduct a virtual, life-like "normal birth" so that they can gain the knowledge, skills, and confidence required of them during actual clinical care labor and delivery settings. The students have been universally enthusiastic in their appreciation of this novel instructional opportunity. A similar curriculum is utilized in the initial instruction of new interns in Obstetrics and Gynecology. Additionally, a curriculum has been designed to instruct more advanced residents in the principles of obstetric forcep applications and delivery and also for vacuum-assisted delivery. Measurable increases in knowledge, skills, confidence, and overall proficiency of the residents have resulted; and, the program has been presented at several national professional forums. The American Board of Obstetrics and Gynecology, among other organizations and institutions, has taken considerable interest in the further evolution of these instructional programs.

Pediatric Clinical Rotation - Exceptional Family Member Program. Several years ago, the Pediatric Clinical Rotation initiated home visits to families with children with special needs. This program has grown to include a set of educational experiences integrated across the four years of medical school. In the first year, medical students have an opportunity, coordinated with the Human Context in Medicine Course, to visit families or adult patients with special needs. In the second year, the Bioethics Course opens with a three-hour session that includes a lecture, film, and small-group discussions with parents whose children have been critically ill during

the first year or two of their lives. In addition to the Pediatric Home Visit in the third year, the Pediatric Clinical Rotation includes two sessions in which faculty members and parents collaboratively offer insights about developmental issues of childhood and provide practice and feedback about pediatric medical interviews. The Family Medicine Clinical Rotation now teaches about advocating for patients and families through standardized patient experiences, a three-and-a-half hour session taught collaboratively with adults with chronic medical conditions, and a home visit that focuses on medical and community resources. A Pediatric Research Elective in the fourth year provides an opportunity for students to: design and initiate research that involves parents and patients for providing insights about health care experiences; plan research that incorporates patients and families; and, respond to surveys and interviews. The Josiah Macy, Jr. Foundation has funded the development of this coordinated set of learning experiences through a grant implemented by **Colonel Virginia Randall, MC, USA,** and **Janice L. Hanson, Ph.D.** During 2002, Doctor Hanson received a three-year grant for \$471,556 from the Health Resources and Services Administration, Department of Health and Human Services to further this work involving parents, patients, and families as advisors to the students. The new project will develop approaches to teaching and evaluating professionalism in the USU SOM Departments of Pediatrics and Family Medicine.

Pediatric Cardiology Module - Cardiac Auscultation at the Simulation Center. Beginning in 2000 and continuing throughout 2002, an innovative case-based, interactive scenario in pediatric cardiology has been introduced into the third-year medical student pediatric clerkship through the advanced technologies of the National Capital Area Medical Simulation Center. This teaching module is an interactive session between the instructor and medical students with discussions on the events of the cardiac cycle and a demonstration on their relationship to heart sounds and murmurs in the normal child as compared to the child with congenital heart disease. Interactive discussion is facilitated by the instructor and covers the following topics: 1) the electrical and mechanical events in the cardiac cycle; 2) the four common functional murmurs; 3) a short overview of congenital heart disease; 4) the normal cardiac auscultation of the child; and, 5) the abnormal clinical findings as illustrated by the more common congenital cardiac defects. The instructor's presentation is supported by slide presentations and the use of computer software. The demonstration of heart sounds and murmurs is based on a CD-ROM, which contains audio files of actual pediatric cardiac sounds as well as other visual resources that are available to the instructor and to each of the students at his/her individual work station. The teaching objective is for the student to recognize the normal clinical findings in the cardiovascular examination of the child and to differentiate between physiologic and pathologic sounds and murmurs. A pre-test is given at the beginning of the session; each student is tested on the heart sounds and murmurs provided by the computer software program. The teaching module is expected to complement the clinical experience during the clerkship and to help develop physical diagnosis skills; a post-test is given at the end of the six-week clerkship to evaluate the progress of the individual student. This educational experience was presented at the National Meeting of the Council on Medical Student Education in Pediatrics in San Diego in March of 2001. The USU SOM Pediatric Education Section presented a poster entitled, *Utilizing a case-based interactive learning module incorporating CD-ROM-based technology to optimize the teaching of cardiac auscultation skills in the pediatric clerkship.*

Patient Simulation Laboratory - A Collaborative Effort.

On April 10, 2001, and June 12, 2001, we brought eight registered nurse students to your anesthesia simulation laboratory for realistic and invaluable advanced cardiac life support training. The experience our students receive in your lab is consistently of the highest caliber and a highlight of their training. As usual, their evaluations of the experience were outstanding. I appreciate the learning opportunity your patient simulation laboratory affords our students. My wish is to continue the collaborative relationship we have established with your staff to provide exceptional simulator training for future Critical Care Nursing Course students.

- **Karen M. Whitman, MS, RN, CS, Major, U.S. Army Nurse Corps, Director, WRAMC Critical Care Nursing Course, Letter to USU, June 28, 2001.**

A collaborative project between the National Naval Medical Center's Department of Anesthesiology and two USU SOM Departments: Anesthesiology; and, Anatomy, Physiology, and Genetics led to the development, in 1997, of a fully interactive medical training laboratory at USU: the Patient Simulation Laboratory (PSL). As mannequin-based simulation was new not only to USU, but also quite rare, in general, throughout the world of medical education, almost every program offered by the USU PSL was developed and implemented by the USU PSL staff. The PSL has been in daily use since its first course offering. This instructional facility supports training in combat casualty care, anesthesia, critical care, trauma, and emergency medicine. Students gain experience in recognizing problems, developing decision-making skills, and refining techniques and procedures.

The PSL has six mannequins that span the range of ages from newborn to adult, both male and female. There are more than 35 customizable *events* ranging from anaphylaxis to ventricular fibrillation that can be assigned to the simulated patients. The *mannequin patient* presents a wide range of responses to the following computer-controlled scenarios: lung ventilation visibly detectable by chest movement; eye lid open/closure; pupil dilation/contraction; palpable pulses; arm motion; thumb twitch; tongue and airway swelling; and, urination. In addition, the *mannequin patient* responds to the following student implemented actions: drug and gas administration; chest tube placement; needle thoracentesis; pericardiocentesis; and, cardiac pulmonary resuscitation. Every kind of signal that can be captured from a *real* patient can be displayed and analyzed on the Clinical Monitor. Patient Simulators typically have over two dozen predefined *patients*, each with unique underlying characteristics and cardiovascular, pulmonary, and metabolic attributes. These patient profiles are modified and new *patients* are constructed to match the teaching objective. The patient simulator can present a wide variety of medical problems and altered physiological states as well as difficult airway management and equipment set-up and/or malfunction. The simulators present scenarios applicable to combat casualty care, anesthesia, critical care, trauma, and emergency medicine.

The drug models include intravenous and inhaled anesthetics, neuromuscular blockers, cardiovascular agents, and a wide range of infusion pharmaceuticals, which affect the simulators as they would human patients. The automated drug recognition system provides for realistic drug administration; each syringe is equipped with a unique computer chip that represents a specific drug. Thus, the instructor can: select the type of a case and adjust the speed and severity to match the ability level of the student; review and/or repeat clinical situations until

a desired level of performance is accomplished (a lesson can be *paused* to provide the instructor the opportunity to give the student feedback); evaluate student clinical decision-making judgments; schedule training at convenient times; and, use the simulator as a research tool for training or evaluation methodologies.

The patient simulators, located in the USU SOM Department of Anesthesiology, are used to train four primary groups: medical students; graduate nurses; anesthesia residents; and, students of the Crisis and Consequence Management of Weapons of Mass Destruction and Terrorism Course. In addition, training is also provided to the following TriService, post-graduate military medical readiness groups: The Army Medical Center and School from the Walter Reed Army Medical Center; the Air Force Critical Care Air Transport Teams from the Malcolm Grow Medical Center; and, USNS COMFORT clinical staff from the National Naval Medical Center.

The PSL has completed its fifth year of teaching the first-year SOM students a simulated cardiovascular reflex scenario as part of their Physiology Course; each year, the SOM students have expressed strong enthusiasm for this simulation presentation. The simulated patient definitely adds a clinical context to some of the physiological and pharmacological principles presented to both the medical and nursing students. In addition, to these hands-on small group (eight students) simulations, the PSL provides live, interactive distance education presentations to the second-year SOM students for illustrating simulated, clinical examples during their Pharmacology lectures. Thus, the PSL brings the hospital to the students through a newly installed Advanced Distance Education Network (ADEN), designed by the PSL staff.

During their third-year anesthesia rotation, SOM students are instructed in the basic fundamentals of anesthesia and the role of the anesthesiologist in surgery. They learn to connect a patient to external life support sources, such as an oxygen mask, a ventilator, or manual ventilation via endotracheal intubation. For the first time, USU medical students combine the lessons learned about the physiology of gas exchange and physiologic and pharmacologic responses, while actually performing the procedures and administering anesthesia on the patient simulator, without putting a patient, or themselves, at risk.

The USU SOM Departments such as Military and Emergency Medicine, Pharmacology, Biochemistry and Molecular Biology, Microbiology and Immunology, and Pathology offer classes focusing on the effects of chemical agents and radiation and biowarfare agents. One such course is the ***Scientific, Domestic and International Policy Challenges of Weapons of Mass Destruction and Terror: Part I***. The course, first offered in 2000, provides an understanding of the medical features and medical countermeasures for living agents or organic products that could potentially be used in warfare, terrorism, or criminal activities in the context of the political implications of weapons of mass destruction. Also incorporated into the course is a hands-on training phase conducted in the PSL; the simulator's real strength is that medical disasters can be scheduled and students can practice repetitively until they gain familiarity, competence, and poise with the unexpected. In conjunction with this course, the PSL has produced inhalational anthrax and marine toxin exposure scenarios, with another scenario featuring smallpox currently in development. The pneumonic plague scenario is also played out in the PSL, placing the students in a real-life situation. Part II of the course, first offered during 2001, focuses on nuclear, radiological, high explosives, chemical agents, and unusual weapons; and, it is also acted out in the laboratory. These realistic exercises result in the class members reaching out to others and forming teams to solve problems; they provide experience with almost every facet of a response to a biological or chemical terrorism event.

During both 2002 and 2003, the USU PSL team received the *First Place Research Award* for their presentations at the Society for Technology in Anesthesia International Meeting on Medical Simulation. The PSL study shows a remarkable reduction in error detection time, when doctors view clinical monitor data via a prototype Head Mounted Display. This concept of providing immediately accessible critical vital sign data to clinicians via a Head Mounted Display is the basis of a patent application by the PSL team; PSL's winning presentation showed acceptance by surgeons to wearing a Head Mounted Display in the operating room.

An Innovative Introduction to the Surgical Clerkship. The third-year surgical clerkship is preceded by a three-day introduction to clinical models and operative procedures utilizing the National Capital Medical Simulation Center (SIMCEN) and the animal surgical facilities in the USU Department of Laboratory Medicine. This innovative and comprehensive approach, which occurs with third-year SOM students every six weeks, familiarizes the students with patient interactions associated with the presentation of common surgical illnesses as well as introducing various surgical techniques, priorities, equipment and procedures. The advanced technologies of the SIMCEN employ live patient models well versed in specific disease histories and symptoms. Disease scenarios include common problems such as pancreatitis, appendicitis, ectopic pregnancy, and gallbladder disease. Students perform comprehensive, focused histories and physicals on two to three *patients* under real-time observation by a faculty-teaching surgeon. The encounter is also taped for interactive student-teacher reviews during small group discussions of techniques and performance. In addition to the patient encounters, separate laboratories are held to teach and perform knot tying, endotracheal intubation and ultrasound fast examination techniques on mannequins. A human patient simulator is used to teach acute trauma care, utilizing various scenarios creating positive and negative outcomes to specific student treatment choices. There is also a virtual reality laboratory for the performance of technical skills including suturing and cricothyroidotomy. The unique experience offered by the two days in the live animal laboratory introduces students to actual operative procedures on an anesthetized animal under sterile conditions. The instrumentation, scrub procedures, apparel and routine are true replicas of actual clinical hospital settings. Students are assigned in groups of three or four to a certified teaching surgeon for the entire two days. Abdominal procedures including appendectomy, splenectomy, bowel resection and cholecystectomy are carried out with each student serving as surgeon, scrub technician, and assistant. On the second day, the thoracic phase is carried out including a pneumonectomy, pericardial window, aortotomy, and chest tube placement. This intense three-day session prepares the student anatomically, physiologically and procedurally for the clinical rotation. The clinical rotations include the standard third-year clerkship in general surgery and surgical specialties. Small group mentoring preceptorships are held weekly as well as Distinguished Professor Lectureships, which are held bi-monthly.

Simulation Center Technologies Utilized During the Surgery Rotation. The advanced technologies of the National Capital Medical Simulation Center are being used in simultaneous fashion every six weeks to introduce the third-year medical students to their surgery rotations. The students are provided both an introductory discussion and a lecture regarding an abdominal surgery laboratory to be held the following day. The patient actors are used to provide an hour-long, three-patient opportunity to elicit, from the medical students, a medical history; and, the patient actors enable the medical students to perform a focused physical examination for a variety of acute abdominal diseases (e.g., appendicitis, pancreatitis, gallbladder disease, ectopic pregnancy, and others). These encounters are videotaped and the tapes are reviewed with the teaching surgeon during the subsequent hour. A suturing and knot-tying laboratory is held in the computer laboratory using both web-based and senior

surgeon instruction. Plastic mechanical models (Laerdal/MPL) are used to teach such skills as endotracheal intubation, chest tube insertion, and surgical airway. The human patient simulator (MEDSIM) is used to teach the best approach to simple clinical problems such as hypotension or hypoxemia. The virtual reality laboratory experience includes starting an IV (HT Medical), creating an anastomosis (BDI), and performing bronchoscopy (HT Medical). Two additional simulators are used to teach emergency trauma procedures: pericardiocentesis and diagnostic peritoneal lavage. These last two trauma skills simulator technologies were developed at the National Capital Area Medical Simulation Center. Through the use of this multi-modality facility, the experience of medical students can be enhanced so that the first time some of the above-described problems or procedures are encountered, it will not be with a live patient, but rather with the most appropriate simulator. Approaches, such as those provided by the advanced technologies of the Simulation Center, are expected to minimize the possibility of medical errors.

Fourth-Year Curriculum.

Yours is the only medical school in America which trains physicians to be ready for duty on the bottom of the ocean or on the surface of the Moon, and any place in between...As students, you went through one of the most rigorous programs in the country... You prepared yourself to treat patients anywhere in the world, under any circumstances.

- **President Ronald Reagan**, Commencement Address, SOM Class of 1987.

Overview. The fourth academic year begins with a one-week Military Preventive Medicine Course. Early in the fourth year, approximately 165 students also take the USMLE Step 2. The 165 fourth-year students have ten four-week blocks for 1,650 rotations. Students must complete an eight week subinternship as well as the following four-week clerkships: Military Contingency Medicine; Military Emergency Medicine; and, Neurology. The senior year concludes with a one-week Transition to Residency Course.

Military Medicine. The Department of Military and Emergency Medicine conducts two courses in the senior year which are required for graduation from the SOM. Although separate in time, they are closely coordinated. For years, ***Military Contingency Medicine (MCM)*** has focused on medicine in a deployed environment and in response to a terrorist attack. The first two weeks of the course are currently devoted to reviewing and expanding basic concepts and manual skills learned in the first two years of Military Studies. While Combat Medical Skills included first-aid at the medic level for the first-year medical students, the ***Advanced Trauma Life Support (ATLS) Course*** is taught at the physician level to the fourth-year students. The USU SOM is one of only three medical schools in the United States that require ATLS for all of their students. Additional topics in the first two weeks include the management of combat trauma, chemical-biological-radiological (CBR) exposure, environmental injuries, and combat stress. Special sections focus on triage, women's issues, and working with non-governmental organizations in disaster relief or humanitarian assistance missions. Integration with national strategic goals, operational missions, and tactical objectives is emphasized in all aspects of the course. The third week of MCM is dedicated to ***Operation Bushmaster*** (see next paragraph) so that didactic lessons can be applied in multiple simulated situations during a field training exercise. The fourth week continues student education in military medicine and begins the transition into hospital-based emergency medicine. Students review basic and learn advanced life support interventions during this period; these two and one half days also prepare the SOM students to excel in a four-week clerkship entitled ***Military Emergency Medicine (MEM)***.

Operation Bushmaster.

I learned that I can't think only in the present, that I have to think ahead. Bushmaster gives those with no prior experience a taste of what is ahead in field medicine.

- **2nd Lieutenant Cristin Kiley, USA**, "Changes to Operation Bushmaster," The USU Quarterly, Winter Issue, 2002, page 6.

The field training exercise, *Operation Bushmaster*, uses the constructs of two United States Army Battalion Aid Stations, one United States Marine Corps Battalion Aid Station, and one United States Army Forward Support Medical Company to allow students to practice skills learned in the Military Contingency Medicine Course and throughout the military and *traditional* SOM curriculum. These treatment facilities are designed to represent first- and second-echelon levels of care within the forward battlefield environment. Real-world and notional modular teams, such as the Air Force's Mobile Field Surgical Teams, have been integrated into the scenarios. Army units have provided front-line ambulances, UH-60 Blackhawk helicopters, and medical personnel to give students experience with front-line medical evacuation procedures and platforms. The scenario reflects a Joint Task Force (JTF) deployment involving all four Services and incorporates the updated policies established by the Secretary of Defense. The students are placed in a resource-restricted environment and are forced to coordinate with theater assets and their *sister* Services in order to accomplish their missions and deliver optimal patient care.

The students practice land navigation, radio communication and other field training, triage and combat casualty care, to include setting up a Battalion Aid Station. Drawing on their classroom lectures and teachings, SOM students are encouraged to develop novel solutions to many operational scenarios and problems. They also are forced to navigate the different evacuation requirements and procedures that each Service utilizes within the battlefield environment. This exposure will allow the USU SOM students to quickly integrate themselves into a future joint combat environment. Students occupy at least three leadership and medical evaluation positions throughout the field operation. They are evaluated on the following: medical proficiency while handling dozens of simulated casualties; leadership skills under demanding and stressful conditions; mission accomplishment and focus; and, teamwork. Drawing on all that the students have learned while at USU, Operation Bushmaster is viewed as the capstone exercise of their military medical education, allowing them to hone their skills in a simulated combat environment.

Operation Bushmaster is conducted three times each academic year, in September, November and January. One-third of the class attends each week-long session of Bushmaster at Camp Bullis in San Antonio, Texas. In a recent issue of the USU Quarterly, **Major Troy Johnson, MC, USA, USU SOM Class of 1995**, was interviewed reference his position as the Academic Director for Bushmaster. Within 18 months of his graduation from USU, Major Johnson, a flight surgeon with a special operations unit, was faced with a real-world mass casualty situation overseas involving the United States Marines who did not have a physician with their unit. Major Johnson had to provide care within a Marine Battalion Aid Station; he knew what to do, due to the training he had received at USU, and was subsequently decorated for his actions. As mentioned above, the USU students are now trained in the Marine Battalion Aid Station. In the past, the Bushmaster scenario was set in Bosnia. Today, the Bushmaster scenario is based in the Middle East; and, in the future, if another area of the World becomes significant, the USU instructors will change the cultural concerns and the diseases to match the new area of interest.

Emergency Medicine Clerkship. The USU SOM requires all students to complete a Clinical Clerkship in Emergency Medicine prior to their graduation as physicians. In preparation for their clinical work in an Emergency Department, all of the senior students participate in an intensive three-day overview of Emergency Medicine. During this didactic phase, students are taught how emergency medicine physicians problem solve. Lecturers demonstrate the steps they use when evaluating patients in the Emergency Department. In case study sessions (small group discussions) led by experienced emergency medicine physicians, students have the opportunity to practice problem-solving techniques. Lectures, case study sessions, and assigned readings give the students the factual knowledge they need to work in Emergency Departments. Students leave for their clinical rotations with a solid understanding of Emergency Medicine.

Students may choose from a variety of sites (military and civilian) to perform their Emergency Department clinical rotations. All military hospitals having training programs in Emergency Medicine are open to USU SOM students. These include: the Darnall Army Community Hospital at Fort Hood, Texas; the Madigan Army Medical Center in Tacoma, Washington; the Naval Hospital in San Diego, California; the Naval Hospital in Portsmouth, Virginia; the Medical Center at Wright Patterson Air Force Base, Ohio; and, the San Antonio Uniformed Services Health Education Consortium, which encompasses the Wilford Hall Medical Center in Lackland, Texas, and the Brooke Army Medical Center located in San Antonio, Texas. In addition, USU SOM students can choose from among several high-volume, trauma intensive civilian sites including: Charity Hospital in New Orleans, Louisiana; the Ben Taub General Hospital in Houston, Texas; and, the University of Maryland Medical Center in Baltimore, Maryland. In the Emergency Department, students function under the supervision of experienced Emergency Medicine physicians and are expected to be active members of the Emergency Department team as they care for patients of all ages and with a variety of medical and surgical problems. Students are encouraged to take part in the didactic activities of the Emergency Department in addition to patient care. Each year, about ten USU SOM students choose Emergency Medicine as their career choice; many have gone on to become leaders in Emergency Medicine.

Operational Electives. The Department of Military and Emergency Medicine, through its Education Division or one of its three centers, sponsors several electives in operational medicine. These may include clinical rotations in military emergency departments or aerospace medicine clinics, enrollment in military courses, or attendance at the Joint Readiness Training Center. Qualification as a flight surgeon may be obtained through either the United States Air Force School of Aerospace Medicine or the United States Army School of Aviation Medicine; during the past years, the Army School has altered the timing and structure of their course specifically to enable USU SOM students better access to this form of occupational medicine. Whereas only one student had attended in the previous two years, five students and one faculty member attended during 2001; four of those six were the top four graduates of the demanding six-week Army course. Nine students attended during 2002. Additionally, three students were sponsored by the Center for Disaster and Humanitarian Assistance Medicine to accompany an Air Force unit on a humanitarian mission to El Salvador. And, two students worked in a trauma center in Armenia before their graduation in 2002.

USU SOM Curriculum Stresses a Military Focus. In addition to the military unique curriculum described above, *the USU SOM academic departments and faculty have structured all of their courses to include: topics specific to military medicine and not covered in the traditional medical school curriculum; and, teaching examples and cases drawn from military medicine.* This content focus is reinforced by the fact that many of the faculty (one third of the billeted basic science faculty and two-thirds of the clinical faculty) are uniformed officers representing the Army, Navy, Air Force, and the Public Health Service; these uniformed instructors provide experience and contextual correlations during their teaching of traditional topics. *The unique practice of military medicine is woven throughout the four years of medical school.*

Curriculum Renewal.

Background. The SOM curriculum utilizes a variety of educational experiences and learning formats, including lecture, laboratory, clinical correlation, small group discussion, computer and web-based experiences, patient simulator, standardized patients, and experiential exercises. The SOM vision for the undergraduate curriculum is that the science of today is taught in an environment that will foster increased long-term, self-directed learning tomorrow. Toward this end, the SOM Executive Curriculum Committee (ECC) completed an exhaustive study of the undergraduate curriculum, and revisions are on-going to minimize the traditional curricular “stovepipes” through course integration and the increased use of clinical material.

In both the first and second years of medical school, there is a heavy emphasis on small group learning. In the first year, this takes the form of laboratories in Structure and Function and discussion groups in Human Context. Additionally, the Introduction to Clinical Medicine Course starts in the first year and begins to develop history-taking and physical diagnosis skills. In the second year, laboratories continue in Pathology and Microbiology, while there is increased use of a small group *problem-based learning* educational format. In both Pathology and Clinical Concepts, groups of 8 to 12 students team with a faculty member to review clinical scenarios. The format of these encounters is designed to flow seamlessly into the second-year portion of the Introduction to Clinical Medicine Course and the clerkships during the third year.

Integration of Clinical Medicine and the Basic Science Experience. There are numerous examples of clinical medicine being integrated into *the basic science experience*. Close collaboration between the Departments of Radiology and Radiological Sciences and Anatomy, Physiology, and Genetics led to the development of computer-based learning resources correlating basic anatomy with the radiological representation of normal and pathologic states. The integrated structure and function curriculum (Physiology and Anatomy) incorporates clinical faculty into its teaching. Several areas in particular - Cardiovascular, Renal, and Pulmonary - have demonstrated extensive clinical integration for many years. The Department of Pathology utilizes many clinical facilitators for its small group discussions. In addition, Pathology has coordinated the format of its case presentations with course directors from Clinical Concepts and Introduction to Clinical Medicine to provide a consistent experience for students. Pathology and Clinical Concepts have also coordinated their curriculum to provide the case scenarios in Clinical Concepts in sequence with topics being discussed in Pathology. The Department of Pharmacology also encourages clinical facilitators to participate in their small group exercises. There are currently several initiatives being considered to move basic science to the clinical years. One example is the proposal before the ECC to develop a computer or web-based curriculum of key basic science topics for exploration in the fourth year of medical school. These examples illustrate basic science and clinical integration either in place or under active consideration.

The Renewal Process. As the Chief Academic Officer of the SOM, the Dean is responsible for institutionalized curriculum management. Policy issues are reviewed and considered by the ECC, which reports to the Dean. Institutionalized curriculum renewal in the SOM is a high priority. The formalized process began with Phase I (1993-1995) of curriculum renewal. During Phase I, a steering committee with four subcommittees was developed to cover the following areas: 1) the history of medical education in the United States; 2) current experiments in curriculum reform; 3) curriculum at the USU SOM; and, 4) professional requirements and outcomes. Subcommittee reports and recommendations were generated and reviewed by the faculty. The Dean's Office and academic departments then offered recommendations on how to best implement the committee's recommendations.

During Phase II (1996-1997), a steering committee and five subcommittees were established; they reviewed or completed the following: 1) objectives and goals; 2) an organizational template for curriculum management; 3) basic science and intra-departmental and clinical integration; 4) outcomes and evaluations of the clinical clerkships, both required and elective; 5) the establishment of topic groups; 6) subcommittee and topic group reports and recommendations; 7) a consensus on the recommendations and implementation planning; and, 8) the implementation process.

In February of 1998, the Dean charged the ECC with reviewing the December 1997 Curriculum Review Report produced during Phase II of the curriculum renewal process. The ECC was also charged with providing oversight for the planning process and the development of an implementation plan for curriculum renewal. This implementation plan is envisioned as an evolutionary process, with changes in the curriculum occurring in an incremental fashion. The ECC completed a draft of the SOM educational objectives, which was reviewed by the Dean and distributed to faculty, students, and staff for comment, and finalized in November of 1998. As changes to the curriculum occur, the SOM Dean has also directed that his office establish and monitor processes for student, faculty, and TriService evaluation of the curriculum changes.

Responsibilities of the Executive Committee on Curriculum. On August 2, 2001, the SOM Dean issued a Policy Memorandum updating the responsibilities of the USU SOM Executive Committee on Curriculum (ECC). The members of the ECC are drawn from the faculty, student body, and administration. Members are charged with representing the interests of the SOM as a whole; not as representatives of specific constituencies. The twelve members of the ECC have been designated with responsibility in seven areas to: 1) articulate, with the concurrence of the Office of the Dean, well-defined learning objectives that each student must meet to receive the M.D. Degree; 2) conduct a biennial review of each required course/clerkship in the SOM undergraduate curriculum, including content, format, teaching methods, course materials and methods for verifying that graduating students have met all of the learning objectives; 3) establish a prospective course/clerkship review schedule that gives course/clerkship directors sufficient time for proper consultation and preparation before the biennial review; 4) complete the course/clerkship review and assessment within 60 days of submission and presentation by the course/clerkship director, including submission of findings and recommendations to the Office of the Dean; 5) request, if necessary, through the Office of the Dean, further information, seek consultation with faculty or external consultants, and, when appropriate, sponsor symposia on curriculum to assist course/clerkship directors or topic group leaders in curricular planning or improvement; 6) periodically review institutional policy concerning the curriculum and educational practices to ensure consistency in the implementation and management of the undergraduate medical education program; and, 7) address other curricular issues and educational initiatives as charged by the Dean, SOM.

Issues addressed by the ECC in recent years include: coordination and/or changes to examination schedules; changes to the academic schedule grid; review of grading policies; review of mandatory attendance policy; discussion and response to student-generated After-Action-Reports; review of fourth-year requirements; consideration of a diversity curriculum proposal; review of changes to the first and second-year Introduction to Clinical Medicine Courses; and, review of the students' military responsibilities and their impact on the overall academic experience.

Responsibilities of Department Chairs and Faculty. The Department Chairs are responsible for establishing objectives, designing content and presenting each course/clerkship assigned to his/her department and for assuring that the performance of students is evaluated in an appropriate and timely manner and in accordance with institutional policy. The Chairs are also responsible for supporting Course or Clerkship Directors with requisite faculty and specifically for assigning teaching responsibilities to faculty members and for allocating departmental resources as required to support the courses, clerkships, selectives, and electives assigned to their departments. Course or Clerkship Directors for departmental-sponsored courses will be appointed by the responsible Chair; Course or Clerkship Directors for interdepartmental courses will be appointed by the Dean, SOM. Faculty members are the content experts in the individual basic science and clinical science disciplines and collectively are responsible for the SOM curriculum. The processes of curricular design, implementation and evaluation must involve broad participation by the SOM faculty both at the departmental level and at the institutional level. Every assigned faculty member is responsible, generally, in coordination with the Course or Clerkship Directors, for fulfilling his/her assigned teaching responsibilities in the areas of undergraduate curriculum.

Center for the Enhancement of Healthcare Training and Outcomes. The Liaison Committee on Medical Education (LCME) has stated that medical faculty and students need to address gender and cultural biases in the delivery of health care and, in general, prepare providers to care for diverse patient populations. The USU SOM Departments of Medical and Clinical Psychology and Family Medicine have developed a biopsychosocial training program for medical students and residents, nursing students, clinical/medical psychologists, prospective health care professionals, and faculty. The Center for the Enhancement of Healthcare Training and Outcomes (CEHTO) enables the University to comply with the LCME requirements in addition to improving USU's curriculum and maximizing health care outcomes. CEHTO has been established to: 1) infuse concepts and processes into existing curricula in order to advance a biopsychosocial philosophy, improve cultural proficiency, and maximize health care outcomes; 2) provide a forum in which students have the opportunity to practice the skills and strategies addressed in the classroom; 3) facilitate the development of culturally respectful relationships - inside and outside of the USU community; and, 4) evaluate the impact of CEHTO and continuously improve and refine the training provided. Fundamentally, CEHTO is designed to teach students, residents, and health care professionals how to maximize their effectiveness. Its ultimate aim is to train providers to use a wide knowledge base, interpersonal skills, technology, and cultural awareness to effect the most beneficial treatment plans for patients. With customized training modules, CEHTO participants also receive training to enhance self-management (i.e., personal stress management, cultural awareness, interpersonal sensitivity) and others (i.e., resolving conflict or dealing with severe physical or mental illness). As a component of the Family Medicine Clerkship Curriculum, for example, medical students receive experiential training. Via facilitated conversations, small and large group exercises, and multi-media presentations, students learn about how cultural factors affect them, their patients, and their interactions with others. Experiences such as these foster an appreciation of cultural diversity, the patients' mental health

needs, and how our own beliefs and biases can impact patient care. Most important, this training gives SOM students the opportunity to consider, rehearse, and evaluate specific strategies to deal most effectively with diverse multi-cultural populations. Hands-on, experiential training modules utilize standardized patients (patient actors) at the USU Medical Simulation Center. Using realistic behavioral simulations, this state-of-the-art medical simulation center provides a unique forum in which participants can practice, develop, and refine new skills, and translate increased cultural awareness into culturally proficient behaviors. Detailed feedback is provided and individualized behavioral prescriptions are generated to assist participants in setting objective goals for improvement.

Departmental Review. A program was adopted by the School of Medicine in 1998 that mandated each department to conduct a “self-study” every five years or at the time of the appointment of a new chairperson. The self-study would be followed with a review of the self-study by a group of “peers” from outside of the University. From 1999 through 2002, self-studies and external reviews have been completed by the Departments of Anesthesiology, Dermatology, Family Medicine, Military and Emergency Medicine, Obstetrics and Gynecology, Pharmacology, Neurology, Radiology and Radiological Sciences, and Surgery. Other departmental reviews pending completion include: Anatomy, Physiology and Genetics; Pathology; Pediatrics; and, Medical History. The results of these studies will be used to chart future courses for these departments in education, research, and community service.

STUDENT AFFAIRS

Class of 2006. During August of 2002, the School of Medicine (SOM) matriculated its twenty-seventh class (the Class of 2006). 1,658 applicants representing all 50 states competed for 167 positions. There were approximately 10 applicants for each position, which allowed a diverse and highly qualified selection of candidates with a motivation toward public service. The Class of 2006 includes 63 Army, 51 Navy, and 51 Air Force, and 2 United States Public Health Service medical students. The demographics of the class are depicted as follows:

- Seventy-eight students (47 percent) were associated in some way with the military before USU matriculation. Of those,
 - Twenty-six students served previously as officers; sixteen had previously served as enlisted personnel; twenty-one were service academy graduates; twelve were direct graduates of ROTC programs; and, three were reservists;
- Forty-one students (25 percent) are women;
- Nineteen class members (11 percent) are minority students (including 11 students from groups classified as underrepresented by the Association of American Medical Colleges); and,
- The average age of the entrants at the time of application was 25 years.

All members of the Class of 2006 hold Baccalaureate Degrees; and, ten students hold Master of Science Degrees. Biology was the most represented undergraduate major of the matriculants (28 percent); eleven percent of the class had majors in Chemistry; and, five percent had majors in Biochemistry. Some of the other disciplines in which members of the Class of 2006 hold degrees are Economics, English, History, Nursing, Physical Education, Physics, and Zoology.

The Office of Student Affairs. Throughout Fiscal Year 2002, the Office of Student Affairs (OSA) was engaged in personal and/or professional academic counseling and career guidance for the 668 students in the SOM. Beginning in September of each year, OSA conducts well over 300 formal interviews. In 2002, this process formally began with the post-matriculation interviews of all 167 freshmen from the first-year class.

Structured Interviews for the First Year Class. The purpose of the MS-I (medical student-first year) interview is to engage each new medical student in a relationship with the OSA and the office staff who will manage his/her professional development and career guidance. The interview is open with an emphasis on the future partnership (or the individual management and consulting network) that will exist between each student and the three deans in OSA. The interview covers five areas: 1) Transition - the move to Washington, D.C., e.g., housing, getting settled, family issues; 2) Sense of Membership in the Class, e.g., within and between Services, professional, social; 3) Sense of Professional Vision, e.g., vision for what will come after

medical school; 4) Adjustment to Student Life, e.g., how are they managing the 24-hour clock; and, 5) Inquiry about Image, e.g., aside from the roles of student, spouse, parent, athlete, what really defines them? Students are free to raise any questions, concerns, or thoughts. The interviews require considerable time, but have definitely proven to be worth the effort for both the students and OSA. These interviews set the stage for an on-going dialogue with each student over the four years of medical school and for establishing a sense of community throughout the student body.

Sponsor Program. In January of 2002, OSA allocated sponsor assignments for the newly accepted students in the Class of 2006. Upon acceptance to USU, members of the incoming class are individually matched with members of the current freshman class. First-year students serve as the incoming students' sponsors; the student sponsor answers questions about housing, moving to Washington, D.C., family issues, military summer training, and many other topics. The student-sponsor relationship has proven to be a valuable tool in assisting the incoming students through matriculation.

Jumping from an aircraft at 1,280 feet, 2nd Lieutenants Reed Kuehn, Chad Cryer, and Johannah Kone (Class of 2005 - on an operational assignment following their first year of medical school) **qualified as paratroopers while attending Jump School at Fort Benning, Georgia. The school was broken down into three weeks: *ground week*, which consisted of jumping out of a mock door, four people at a time, and practicing landing and falling by hooking a cable from a 34-foot tower; *tower week*, which advanced them to a 250-foot tower, fortifying the practice of landing and falling, mass exiting from an aircraft, air mobility and emergency malfunctions of the parachute and how to handle them; and, *jump week*, where all of the training is pulled together and the students perform four jumps, including a night jump. "The most exciting part was at the door waiting to jump, where it was extremely loud, then jumping into complete silence," said Kuehn.**

"We went to represent USU, complete the course and to gain knowledge for our futures," said Cryer. "It was good to see the everyday life of the people whom we will be taking care of and the conditions that they go through." All three students gained an understanding of the importance of preventive medicine. Just doing the simple things like staying well-hydrated and applying sunscreen helped keep troops comfortable with all of their gear on. "There was lots of monotony in the training, falling again and again, as repetition helped seed in people's minds what to be aware of to prevent many injuries," said Cryer.

In the case of most of the class, this was the group's first experience with the operational side of the military. The large volume of enlisted troops impressed Kone, in particular. "I think the experience gave me a better awareness of what soldiers go through," Kone said. "Even though half of the time we were sitting around waiting to jump, while we were waiting, we had to sit with all of the equipment on in the heat." Kone felt this experience gave her a better understanding of the unique burdens that the enlisted soldiers have to face... "When you are

treating someone and they see the patch (patch earned upon completion of the operational training) ... you have a connection with the patient.”

- *USU Students Gain Deployment Experience, USU Medicine, Fall 2002, page 27.*

USMLE Step 1 Preparation. During Fiscal Year 2002, OSA prepared the second-year students for the United States Medical Licensing Examination (USMLE) Step 1 Board Examination, which the students took between May and June of 2002, prior to beginning their first of the third-year clinical rotations. In 1999, the USMLE introduced computer-based testing for the Step 1 and 2 Examinations. During 2002, OSA provided class-wide presentations covering the fundamentals of the examination process, test preparation strategies, and test-taking skills. Students also organize their own informal programs, which have included mini-lectures on broad relevant topics, meetings with select faculty, and group study sessions. The USU first-time pass average for the Step 1 Board Examination during 2002 was 90 percent (the national first-time pass average for 2001 was also 90 percent). Most of the USU fourth-year students (SOM Class of 2003) completed the Step 2 Examination between July and September of 2002. The overall performance for the Class of 2003 was strong with a pass rate of 96 percent.

Third-Year Clerkship Scheduling. Also during February, OSA met with the second-year students to schedule their third-year clerkships. To increase student input into the orchestration of their third-year clerkship schedule, OSA has moved from a system where students were simply given a pre-selected schedule of randomly assigned clerkships. The student now has the ability to place rotations of special interest in the first half of his/her junior year and the opportunity to experience potential career choices at an early point. In addition, the current system allows students to coordinate some of the required travel in their academic third year with personal events that may already be planned or anticipated. The staff of OSA conducted Round 1 clerkship selections for the Class of 2004 using randomly assigned numbers. During the second week of February, students met as a group and picked rotations for the remaining rounds. The students shared equally in opportunities for assignments of choice and expressed their appreciation for the process.

Graduate Medical Education Planning Interviews. OSA conducts interviews with the third-year medical students during the fall term. During the first few months of 2002, OSA met individually with members of the junior class to conduct fourth-year planning. The hour-long meetings covered Graduate Medical Education (GME) planning, specialty choice, interviews, and specific sequencing of senior rotations to maximize the selection of their residency of choice; again, available selections for senior-year rotations exceeded the general expectations of the students. OSA arranged program schedules that enhanced student growth, professional experience, and individual preferences. A major product of this process is the Dean's Letter, which presents a comprehensive picture of each student's strengths. Selection for GME positions is competitive; OSA and students worked together to create the best nomination packages possible.

Graduate Medical Education Selection Board. The Joint Service Selection Board convened during the week of December 2 - 6, 2002; and, 155 USUHS seniors (the Class of 2003) were selected for PGY-1 positions: Army - 55; Navy - 50; Air Force - 50. The overall selection rate for FIRST CHOICE programs was 74 percent. USU had 114 out of 155 students match for first choice both in specialty and training site. Twenty-five additional students of the Class of 2003 received their first choice in specialty, resulting in 90 percent (139 out of 155) receiving their first choice in specialty. Nearly half of the class (45 percent) was selected for training in a primary care specialty. Seventy seniors will begin their residency training during this Summer in the following areas: Family Medicine - 26; Internal Medicine - 28; Pediatrics - 12; and, Obstetrics and Gynecology - 4. The directors of the MHS military programs once again demonstrated confidence in the USU SOM graduates.

The USU Military Medical Student Association. The Military Medical Student Association (MMSA), a quad-service, student-run organization, originated at USU more than thirteen years ago. MMSA's goals include developing lines of communication among military medical students nationwide, providing information, and promoting morale and unity among future military medical officers.

Unlike USU medical Students, the Health Professions Scholarship Program (HPSP) students attend universities in the civilian sector; they receive tuition and books and are paid a monthly stipend while working toward their medical degrees. The HPSP students receive limited military training and influence while attending the civilian schools. To share their unique military training, MMSA has sponsored conferences where residency directors and medical specialty representatives from around the country, and USU staff and faculty members present lectures and hold discussions on various topics, including service specific issues, military medical history, operational considerations of military medicine, and basic military concerns which affect both USU and HPSP medical students. The USU MMSA has also established the *MMSA Journal*, which provides valuable military information of interest to medical students; the MMSA goal is to make copies of the journal available to all HPSP students.

USU Students Appointed on Liaison Panels. Among all of the medical students in the United States and Canada, the Association of American Medical Colleges (AAMC) chose two USU SOM students to represent medical students on a pair of key panels during 2001, two prestigious assignments. **Ensign David Brett Major**, at the time, a fourth-year medical student, was chosen to represent the AAMC as the student member on the Liaison Committee on Medical Education (LCME). His one-year term began on July 1, 2001, and ended shortly after his graduation in 2002. **Ensign Sean McBride**, now, a fourth-year medical student, was appointed by the Administrative Board of the AAMC to serve as the student liaison to the Committee on Admissions. Founded in 1876, the AAMC comprises the 125 accredited United States medical schools, 16 accredited Canadian medical schools, 400 major teaching hospitals and health systems, 90 academic and professional societies representing nearly 100,000 faculty members and the Nation's health through the advancement of medical schools and teaching hospitals. The AAMC and its members set a national agenda for medical education, biomedical research, and health care. The association also works to

strengthen the quality of medical education and training and knowledge, to advance research in the health sciences, and to integrate education into the provision of effective health care.

ACHIEVEMENTS OF THE SOM ALUMNI

Recent tragic events and the current Global War on Terrorism clearly show the benefits of preparedness and training. It is gratifying to know USUHS is leading the way in preparing military healthcare professionals to meet current and future challenges.

- **Richard B. Myers, Chairman of the Joint Chiefs of Staff**, Letter to USU dated March 29, 2002.

The extraordinary retention of these military officers ensures continuity for the MHS and the safeguarding of lessons learned during combat and casualty care. Currently, the USU School of Medicine (SOM) alumni represent over twenty-one percent of the total physicians on active duty in the military services. Furthermore, a significant number of USU graduates who have completed their residency training hold leadership or operational positions throughout the MHS. The University's mission statement, *Learning to Care for Those in Harm's Way*, succinctly captures its essential commitment to Force Health Protection.

- **Vice Admiral Michael L. Cowan, Surgeon General of the Navy**, Testimony before the House Armed Services Committee, Military Personnel Subcommittee, April 10, 2002.

I deployed to the Gulf very early, August 11, 1990, as a senior medical officer with the Air Force Special Operations Command. Deployed in this capacity, my responsibilities ranged from flying training and combat support missions to representing my command at theater-level planning conferences...

The heat in August was incredible, with temperatures up to 125 degrees. Yet our maintenance personnel had to work around the clock to get our aircraft combat ready. Just sleeping six hours in the heat caused dehydration to the point of dizziness. Our medical team was on the flight line and around our tent-city bringing sunscreen and ice water to the personnel because they could not drink 100 degree water out of a canteen.

My training at USUHS had prepared me for working in austere conditions without fixed facilities. The tap water in our camp became contaminated by the sewer system, and water tanks had to be provided with chlorine levels monitored daily. Because of the *military medical history* classes I had at USUHS, I knew that disease and non-battle injuries could make an army ineffective before the battle began. *Preventive medicine* is an entire department and course of study at USUHS. I had the training and references... to avoid repeating the mistakes of previous wars... Because of the emphasis on *tropical medicine* at USUHS, I was able to advise the Commander and troops about potential infections and how to protect themselves... Because

we studied the air evacuation system and did practice exercises using it at USUHS, I was able to coordinate a unique mini-mobile aeromedical staging facility at our intermediate operating base. This provided the transition from our helicopter rescue aircraft to the C-130 medical evacuation system. As our troop build-up progressed, hospitals from each Service increased. Because at USUHS I had been taught the organization of medical systems in the other Services, I was able to arrange referrals for our patients much more easily... We had no logisticians, but were able to obtain supplies through the Army depot system which I also learned about at USUHS.

Another area of major concern for our personnel was chemical warfare. Because of the thorough preparation and field training I had as a student at USUHS, I was able to develop a training program in unconventional warfare, such as chemical and biological threats, which increased confidence and decreased anxiety in our troops... When we deployed to our forward locations, there were no designated disaster preparedness personnel. The USUHS experience came in handy again, as I assumed those responsibilities. A plan for decontaminating aircraft, vehicles, and personnel was created. Materials were purchased and positioned to maximize readiness.

To summarize the impact of the 4-year immersion in military medicine at USUHS on my preparation for war, I appreciated the operational mission of my unit and how I, as a medical officer, fit into the process of planning and executing that mission. This went well beyond treating patients. It involved analyzing the tactical situation, advising the Commander, and integrating with other Services. USUHS graduates were well prepared.

- **Lieutenant Colonel Charles Beadling, USAF (USU Class of 1984, currently at the Rank of O-6),**
Testimony before the Senate Appropriations
Sub-Committee on Defense, April 14, 1994, page 95.

General Overview. The graduating Class of 2002 was the twenty-third class to receive Medical Degrees from USU. *As of April 2003, of the total 3,268 medical school graduates, 2,620 remain on active duty in the Uniformed Services (Army - 1,016; Navy - 748; Air Force - 762; USPHS- 94); and, the 2,526 USU SOM alumni on active duty in the Military Health System represent over 21 percent of the total physician force in the Department of Defense - 11,907 physicians.* USU graduates have a seven-year obligation, which only begins after they complete their three-plus years of residency training. This obligation is exclusive of any other service obligations they may have already incurred, such as graduation from one of the Service Academies. After twenty-three graduations, data is now available to document that the USU SOM graduates are meeting, or surpassing, the goals established by the founders of USU. Since the first graduation in 1980 to April of 2003, the overall retention rate for USU graduates is 83.6 percent; of the ten USU SOM classes, which graduated between 1990 and 1999, the retention rate is 95.3 percent (Congress had originally envisioned retention rates close to 70 percent). The average USU physician graduate serves at least 18.5 years.

An example of the critical role of USU graduates in the MHS was reported during February of 2001, when the Center for Navy Analysis (CNA) provided data on medical retention to the Navy Surgeon General for use in his responses to the Senate Appropriations Committee. The Navy Surgeon General informed the Congressional Committee that his most undermanned specialties were general surgery and all surgical subspecialties, orthopedic surgery, diagnostic radiology, anesthesiology, and urology. Many of these specialties are critical wartime specialties and shortfalls could have a negative impact on medical readiness. *Overall the median length of non-obligated service for physician specialists averages only 4.4 years. That average drops to 2.9 years when USU graduates are excluded; the median length of non-obligated service as a specialist for USU graduates is 9 years.*

Significantly, in April of 2003, CNA released *Phase II: The Impact of Constraints and Policies on the Optimal-Mix-of-Accession Model* of its major study, Life-Cycle Costs of Selected Uniformed Health Professions. The second of six major findings states: *policy-makers need to consider the costs and benefits for each accession source. For example, even though USUHS accessions are the most costly (the General Accounting Office has reported that when all Federal costs are included, the cost of a USU graduate is comparable to the cost of an HPSP graduate), their better retention makes USUHS the most cost-effective accession source for filling O-6 grade requirements* (page three of the report).

In just a short timeframe, USU graduates have become well respected in their medical specialties and have become the core leadership in areas of military medicine ranging from special operations and hospitals, to the White House and the newly established Department of Homeland Security, to deployments to Afghanistan and Iraq, and to assignments aboard ships at sea or with the Blue Angels, the NASA Johnson Space Center, the Secretary of Defense, and the Congress of the United States. Following the terrorist attacks on September 11, 2001, USU graduates were strongly represented among the medical relief workers at the World Trade Center and at the Pentagon; they led the efforts to identify remains at the Dover Port Mortuary; and, USU graduates assisted in directing the Nation's medical response in the wake of the anthrax attacks. On May 12, 2003, USU was provided with an *initial* (and ever-increasing) listing of physicians deployed for Operation Iraqi Freedom from the Army; of the 346 Army physicians, 67 (almost 20 percent) were USU SOM alumni. Other alumni are engaged in patient care or research in military hospitals and clinics around the world, administering to active duty officers and enlisted personnel, retirees, and family members. Currently, 14 of the 58 Specialty Consultants to the Army Surgeon General are USU graduates; 8 of the 45 Specialty Consultants to the Navy Surgeon General are USU graduates; and, 18 of the 59 Specialty Consultants to the Air Force Surgeon General are USU graduates. USU graduates are, and continue to provide, a strong cadre of leaders who ensure the continuity of military medicine.

School of Medicine Is Recognized by the American Academy of Family Physicians. In keeping with its long-standing tradition, the Department of Family Medicine once more received a Family Practice Percentage Award from the American Academy of Family Physicians. The award recognizes medical schools for their success in making family practice a top career choice for graduating medical students. A total of 27 medical schools received the Year 2002 award, which recognizes the highest three-year average of graduates entering family practice residency training programs from 1999 through 2001. The USU SOM received a Bronze Percentage Award for a three-year average of 20.3 percent.

Second USU Alumnus Is Promoted to O-7. USU's second flag officer, **Brigadier General Charles "Bill" Fox, MC, USA, USU Class of 1981**, was initially triple-hatted as the Corps Surgeon for the XVII Airborne Corps, Commander of the 44th Medical Command, and Director of Health Services at Fort Bragg, North Carolina. He is currently assigned as the Commanding General at the Brooke Army Medical Center and Great Plains Regional Medical Command at Fort Sam Houston, Texas.

Third USU Alumnus Is Selected for Promotion to O-7. USU's third alumnus selected for flag officer is **Brigadier General (select) Bill Germann, USAF, MC, USU Class of 1982**, who was selected during 2003 to command the 89th Medical Group, Malcolm Grow USAF Medical Center, at Andrews Air Force Base, Maryland. Brigadier General (select) Germann is currently serving as the Air Education and Training Command Surgeon at Randolph Air Force Base, Texas.

USU Alumni Earn Promotions to O-6.

USU Army Graduates Selected for Promotion to Colonel - 2002.

Thirty-eight percent of the medical corps officers selected for promotion to Colonel (O-6) were USU SOM graduates. Of 68 medical corps officers designated for O-6, 26 were USU SOM alumni; and, one of the two physicians selected below the zone was a USU alumnus.

USU Navy Captain Promotion Selectees -2002.

The Navy released the promotion list for Captain (O-6) Medical Corps during the first quarter of 2002. There were 256 physicians considered for promotion to O-6 in or above zone. Of those, 33 were

USU alumni; 223 were non-USU alumni. Overall, 72 physicians were selected for promotion, with no below zone selects. Of the 33 USU alumni considered for promotion, 11 were selected, resulting in a 33 percent selection rate. Of the 223 non-USU alumni considered for promotion, 61 were selected, resulting in a 27.4 percent selection rate. Again, USU graduates were selected at a rate higher than their peers.

USU Air Force Graduates Selected for Promotion to Colonel - 2002.

Lieutenant Colonel Andrew Satin, USAF, MC, USU SOM Class of 1986, the Director of the Uniformed Services Residency in Obstetrics and Gynecology and the Vice Chair and Professor of the USU SOM Department of Obstetrics and Gynecology, and **Lieutenant Colonel Christopher Zahn, USAF, MC, Class of 1986**, Associate Professor and Head of the Continuing Medical Education Division of the USU SOM Department of Obstetrics and Gynecology and Consultant to the Air Force Surgeon General for Obstetrics and Gynecology, were among the Air Force USU alumni recently selected for promotion to O-6.

U.S. Public Health Service Graduates Selected for Promotion to Captain - 2002.

The U.S. Public Health Service promoted several USU graduates to Captain during Fiscal Year 2002. **Commander Karen Parko, USPHS, USU SOM Class of 1991**, was one of only 18 PHS Commissioned Corps officers selected for an Exceptional Capability Promotion. She assumed the rank of Captain (O-6) on July 1, 2002. Commander Parko is assigned as the Director, Neurological Services, at the Northern Navajo Medical Center in Shiprock, New Mexico. **Captain Anderson Funke, USPHS, M.D., USPHS USU SOM Class of 1988**, was promoted to O-6 in October of 2002. Captain Funke is the Medical Director of the Carolina Health Centers in Greenwood, South Carolina.

USU SOM Graduates Hold Leadership Roles and Earn Special Recognition throughout the Uniformed Services - Selected Examples from the USU SOM Alumni.

Class of 1980.

Colonel Howard Heiman, MC, USA, assumed the position of Chief of the Neonatal Service at the Wilford Hall Medical Center in late 1999 and continued in that assignment until his retirement in August of 2002. Among his most notable achievements was the development of the first modern aeromedical neonatal transport system for the Department of Defense, for which he set the national standards, and authored a chapter and technical review. He received the Best Resident Teaching Award two times, the Army Surgeon General's "A" Proficiency Designator, and served as the Consultant to the Army Surgeon General for Neonatology. During February of 2002, the following was reported over the *Air Force News Service*:

LACKLAND AIR FORCE BASE, Texas (AFPN) --People from a highly specialized team at Wilford Hall Medical Center flew to Okinawa, Japan, on February 9, 2002, and brought

back a 3-day-old boy who likely would not have survived without their help. The child of a Marine, stationed on Okinawa, was born on February 8th without a left diaphragm. Without the diaphragm, some of his intestines were putting pressure on his lungs and other organs in his chest. The baby's lungs were slowly failing. If this continued, medical officials said the baby would likely die in less than two days unless he was put on heart-lung by-pass, which is called extracorporeal membrane oxygenation, or ECMO... The only long-range transport heart-lung by-pass capability in the world is at Wilford Hall Medical Center. Air Force doctors at the U.S. Naval Hospital in Okinawa asked specialists at Wilford Hall's specialized Neonatal Intensive Care Center for help on February 8th, and within 12 hours, a transport team was launched on a series of U.S. Air Force aircraft to Okinawa. The 16-member neonatal critical care air transport team loaded their equipment on a C-130 Hercules, and with the help of people from the 433rd Airlift Wing, flew out of Kelly Field just before dawn on February 9th, and arrived in Okinawa 25 hours later. Within three hours after arriving on Okinawa, the ECMO team put the infant on the portable heart-lung bypass system to stabilize the baby until surgery could be performed. "What our team did gave the baby a much greater chance of survival," said *Army Colonel Howard Heiman, the neonatologist who headed up the team.* "The baby went from a 5 percent to a 60 percent chance of survival with the help from our team." The team then transported the infant on a portable ECMO unit by ambulance to a C-141 Starlifter that flew them back to the United States. They arrived back at Wilford Hall Medical Center on February 11th, marking the end of the 56-hour rescue mission.

Captain Sandra Yerkes, MC, USN, is currently the Deputy Chief of the Navy Medical Corps, assigned to the Navy Bureau of Medicine and Surgery (BUMED) in Washington, D.C. Her previous assignment was as a senior medical corps detailee at the Naval Bureau of Personnel in Memphis, Tennessee.

Class of 1981.

Colonel Don Bradshaw, MC, USA, served during 2002 as the Director, Clinical Operations Division, of the TRICARE Lead Agent, Fort Carson, Colorado. Colonel Bradshaw was designated to assume command of the Martin Army Community Hospital at Fort Benning Georgia, during 2003.

Colonel Ken Franklin, MC, USA, retired at Fort Benning, Georgia, after 25 years of service in June of 2002. His final assignment was as Chief of the Winder Family Clinic and as faculty for the Martin Army Community Hospital Family Medicine Residency. Franklin remains active in the Uniformed Services Academy of Family Physicians and plans to speak on the rewards of a career in Army medicine at Michigan high schools and colleges.

Colonel Kevin Keenan, MC, USA, is currently serving as the Dean of the Joint Special Operations Medical Training Center at Fort Bragg, North Carolina.

Colonel Ann Norwood, MC, USA, Associate Professor and Associate Chair of the USU SOM Department of Psychiatry, has been actively working with the American Psychiatric Association to assist the areas impacted by the global war on terrorism. During October of 2002, Colonel Norwood was identified for the position of Special Assistant to the Assistant Secretary of Health at the Department of Health and Human Services (HHS); she transferred from USUHS to HHS during May of 2003.

Class of 1982.

Colonel David Burris, MC, USA, FACS, DMCC, was named as Interim Chair of the USU School of Medicine Department of Surgery in October of 2002. Colonel Burris completed his general surgery residency at the Walter Reed Army Medical Center, has his Critical Care Certification, and is the Military Region XIII Chief for the Advanced Trauma Life Support (ATLS) Subcommittee of the Committee on Trauma of the American College of Surgeons. In that position, Colonel Burris is responsible for all ATLS programs within the Department of Defense. *During March of 2002, Colonel Burris reported that USU is one of three universities in the country permitted to teach the ATLS Course without using animals.* The American College of Surgeons allowed testing a non-animal model program for the teaching of ATLS; and, the USU President and Dean, SOM, approved the use of non-animal simulators in the Courses at USU.

Colonel William Germann, USAF, MC, was selected for promotion to Brigadier General, making him USU's third alumnus to achieve flag rank behind Brigadier General William Fox, MC, USA, USU SOM Class of 1981 and Rear Admiral E. Connie Mariano, MC, USN (Retired), USU SOM Class of 1981. Brigadier General Germann will take command of the 89th Medical Group (Malcolm Grow USAF Medical Center), Andrews Air Force Base, Maryland, in June of 2003.

Colonel William P. Madigan, MC, USA, is the Chief of Ophthalmology at the Walter Reed Army Medical Center, the Army's Consultant to the Surgeon General for Ophthalmology, a member of the USU SOM Ophthalmology Division, and the architect of the Army's Laser Refractive Surgery Program. Colonel Madigan explains that the capability exists to dramatically enhance the fighting forces' combat readiness through application of new technology. According to Colonel Madigan, through the Army's Military Refractive Readiness Program, a soldier's vision can be dramatically improved, enabling him to better perform his duties and improve his survivability on the battlefield. It is estimated that one-third to one-half of soldiers on active duty require some form of optical correction. Since the first laser eye surgery was performed in January of 2002, more than 750 patients have been treated.

Colonel Alton Powell, USAF, MC, was selected to command the Air Force medical treatment facility at the 341st Medical Group, Malmstrom Air Force Base, Montana, during 2002. His previous assignment was at the hospital at Sheppard Air Force Base, Texas.

Colonel Lawrence Riddles, USAF, MC, assumed command of the Air Force medical treatment facility of the 5th Medical Group, Minot Air Force Base, North Dakota, during 2002. His previous assignment was as the surgical operations squadron commander at the 81st Medical Group, Keesler Air Force Base.

Class of 1983.

Colonel Cliff Cloonan, MC, USA, is serving as the Interim Chair of the Department of Military and Emergency Medicine at the USU SOM through June of 2003. Colonel Cloonan was assigned to USU in July of 2000, where he served as the Vice-Chair of the Department until August of 2001, when Craig Llewellyn, M.D., Colonel, USA (retired), stepped down as the Department Chair of Military and Emergency Medicine. Colonel Cloonan had previously served as the Dean of the Joint Special Operations

Medical Training Center at Fort Bragg, North Carolina, for three and one half years. From 1990 through 1993, Colonel Cloonan served in the USU SOM Department of Military and Emergency Medicine as an Assistant Professor; he was also the Course Director for both the Combat Medical Skills Course and the Introduction to Combat Casualty Care Course. Currently, in addition to serving as Interim Chair, Colonel Cloonan continues to serve as the current Emergency Medicine Specialty Consultant to the Army Surgeon General.

Captain Kevin Yeskey, M.D., USPHS, FACEP, Associate Professor, Department of Military and Emergency Medicine, Board Certified in Emergency Medicine, served during 2001, as the Director of the Bioterrorism Preparedness and Response Program for the Centers for Disease Control (CDC) in Atlanta, Georgia. Captain Yeskey was named as the Acting Director of the program on August 20, 2001; and, he was selected as the Director on December 1, 2001. As the Director, he was charged with enhancing CDC's capacities to assist States and other partners in responding to bioterrorism. In addition to infectious disease concerns, other CDC efforts under this program included consideration for chemical terrorism, a National Pharmaceutical Stockpile, and National Lab Enhancement. *Captain Yeskey is currently serving as the Director, Office of Emergency Response, in the newly established Department of Homeland Security.* During 2002, the Director of CDC delivered remarks at a ceremony in the Washington, D.C., Health and Human Services (HHS) headquarters to mark the one-year anniversary of September 11, 2001. The CDC Director stated the following:

The Secretary of HHS has already mentioned many of the CDC heroes and heroines who contributed to that response, but there are a few others that I would just like to mention. It's important to appreciate the role that *Dr. Kevin Yeskey* and *Mr. Joe Henderson* played. These were the two individuals who *provided the leadership for the Bioterrorism Preparedness and Response Program at CDC at the beginning of the 9/11 crisis, and sometime thereafter...overnight... created an operations center to handle the anthrax attacks which were the largest multi-jurisdictional outbreak investigation that CDC had ever conducted.* Now, for those of you who are used to command and control, that may seem like a straightforward decision, but for most of us at CDC, we had no idea what an emergency operations center was, and so we had to go into a very steep learning curve, and without their leadership, I don't think we would have been as successful with that as we were.

Class of 1984.

Colonel Charles Beadling, USAF, MC, was selected to command the 375th Medical Group, Scott Air Force Base, Illinois, during 2002. Colonel Beadling's last assignment was as the Commander of the 95th Medical Group at Edwards Air Force Base, California.

Captain Sandra Kweder, USPHS, M.D., Associate Professor, USU SOM Department of Medicine, was selected to serve as the Deputy Director of the Food and Drug Administration's Office of New Drugs during 2002. Captain Kweder's previous assignments included serving as Deputy Director of the Office of Drug Evaluation IV, Co-Chair of FDA's Pregnancy Labeling Taskforce, Acting Director of the Office of Review Management, and Acting Director of the Office of Drug Evaluation II.

Colonel Kimberly Slawinski, USAF, MC, will assume the position of Commander of the 8th Medical Group at Kunsan Air Base, Korea, in June of 2003. Colonel Slawinski's previous position was the Director of the Surgeon General's Tactical Action Team at Bolling Air Force Base in Washington, D.C.

Colonel Terry Walters, MC, USA, finished her courses at the Army War College and was selected to command the 1st Medical Brigade at Fort Hood, Texas. Colonel Walters is also a graduate of the Master of Public Health Program at USU.

Class of 1985.

Captain Hans Brings, MC, USN, is a vascular surgeon attached to the Navy's Fleet Hospital Three (FH-3), the first expeditionary medical facility assigned to a war zone. Captain Brings, who is stationed at the National Naval Medical Center in Bethesda, Maryland, was among a team of 300 health care providers and construction battalion personnel deployed to Iraq with the Pensacola, Florida-based fleet hospital. FH-3 is the latest effort to increase the life-saving capabilities of Navy medicine. With an eye on delivering care faster, the 9-acre, 116-bed facility is designed to provide treatment in the field to those who risk their lives on the battlefield. FH-3 went to Iraq with 166 trucking containers filled with more than \$12 million in medical equipment and supplies.

Captain Robert Darling, MC, USN, was named Senior Medical Advisor to the Navy Medicine Office of Homeland Security. "Fighting terrorism is the single most important objective to ensure our national defense, and we need our very best talent dedicated to the cause. Captain Rob Darling is our most highly qualified expert and will guide us well" (from remarks by Rear Admiral Donald C. Arthur, Deputy Surgeon General of the Navy and Chief of the Medical Corps). For example, during 1996, when the White House was looking for a new White House Physician, a post generally filled by internists, surgeons, or family physicians, Captain Darling was the first emergency physician to win the assignment. While at the White House, Captain Darling assisted the Secret Service to better understand the threat of a biological attack from a medical perspective.

Colonel Loren Erickson, MC, USA, was selected to command the U.S. Army Center for Health Promotion and Preventive Medicine-Europe, in 2003.

Lieutenant Colonel Bryan Funke, USAF, MC, previously the Commander of the 325th Aero-medical Squadron, at the Tyndall Air Force Base in Florida, is currently the Commander of the 14th Medical Group at the Columbus Air Force Base in Mississippi.

Lieutenant Colonel Doug Liening, MC, USA, who previously held an operational position as the Division Surgeon for the 82nd Airborne Division at Fort Bragg, North Carolina, is currently serving as the Deputy Corps Surgeon for the 18th Airborne Corps also located at Fort Bragg.

Colonel Sean Murphy, USAF, MC, currently a student at the National Defense University, Fort McNair, Washington, D.C., has been selected to serve as Commander of the 325th Medical Group at Tyndall Air Force Base, Florida.

Commander Tom Snead, MC, USN, is serving as the Officer-in-Charge of the Branch Medical Clinic at the Naval Base, Ingleside, Texas.

Class of 1986.

Colonel Kory Cornum, USAF, MC, assumed the position of Commander of the Medical Operations Squadron at Ramstein Air Base, Germany, during 2003.

Colonel Rhonda Cornum, MC, USA, featured in a special double issue of *U.S. News and World Report*, "Real Heroes: 20 men and women who risked it all to make a difference," is serving as the Commander of the 28th Combat Support Hospital in Landstuhl.

Colonel Clifford Porter, MC, USA, is on the staff of the General Surgery Service at the Madigan Army Medical Center in Tacoma, Washington. He is also the Commander of the 250th Forward Surgical Team (Airborne).

Lieutenant Colonel Andrew Satin, USAF, MC, is the Director of the Uniformed Services Residency in Obstetrics and Gynecology and the Vice Chair of the USU SOM Department of Obstetrics and Gynecology. The residency program was recently granted the maximum five-year accreditation by the Obstetrics and Gynecology (OBG) Residency Review Committee of the Accreditation Council for Graduate Medical Education. The residency program is the first in OBG to move from provisional status as a newly integrated program directly to the maximum accreditation of five years. It is a fully-integrated program under the institutional sponsorship of the National Capital Consortium based at the National Naval Medical Center and the Walter Reed Army Medical Center. Of the more than 250 OBG residency programs in the United States, only nine have achieved the five-year maximum accreditation.

Colonel Steven Swann, MC, USA, is currently assigned as the Command Surgeon for the Joint Special Operations Command at Fort Bragg, North Carolina. He will assume command of the Baynes-Jones Army Community Hospital at Fort Polk, Louisiana, during 2003.

Colonel Thomas Travis, USAF, MC, recently assumed command of the 311th Human Systems Wing at Brooks City-Base, Texas.

Class of 1987.

Captain Tom Grieger, MC, USN, Associate Professor, USU SOM Department of Psychiatry, was in charge of the Navy Special Psychiatric Rapid Intervention (SPRINT) Team helping out at the Pentagon and the Navy Annex following the terrorist attacks on September 11, 2001. The team provided supportive services to 2,000 active duty and civilian employees on the Navy staff. Captain Grieger continues to provide significant support as a member of the USU Center for the Study of Traumatic Stress.

Colonel Byron Hepburn, USAF, MC, is serving as the Command Surgeon of the United States European Command in Stuttgart, Germany. He was previously assigned as the Commander of the Hospital at McChord Air Force Base, Washington.

Colonel Timothy Jex, USAF, MC, is serving as the United States Central Air Force (USCENTAF) Command Surgeon, based at Shaw Air Force Base, South Carolina. Colonel Jex is responsible for the medical planning at USCENTAF. He also manages medical war readiness materials for the USCENTAF, provides supervision, establishes policy, works logistics issues for all of the deployed medical units, handles all medical issues for the Central Air Force Combat Command, and generally provides leadership for all of the deployed medical personnel. Colonel Jex was also deployed to Afghanistan during 2001.

Lieutenant Colonel Edward Lucci, MC, USA, is the Chief of Emergency and Operational Medicine at the Walter Reed Army Medical Center (WRAMC). He was the first emergency physician to arrive on the scene after terrorists crashed American Airlines Flight 77 into the Pentagon. On staff at WRAMC since 1997, Lucci serves as the hospital's team leader for the special response team for chemical and biological events. He was also interviewed by *U.S. News and World Report* (special edition) and a program that has been broadcast on the PBS Network.

Lieutenant Colonel Paul Mongan, MC, USA, is serving as the Chair of the USU SOM Department of Anesthesiology. *He is the first medical school alumnus to become a Chair of a clinical department at the University.* Lieutenant Colonel Mongan has been an Anesthesiology faculty member since 1997, serving as Director of Research and Associate Professor, and since 1999, as Vice Chair.

Class of 1988.

Lieutenant Colonel Michael C. Edwards, USAF, MC, FACS, holds dual positions as Chief of Surgical Services and Chief of the Professional Staff at the 99th Medical Group, Mike O'Callaghan Federal Hospital, Nellis Air Force Base, Nevada.

Captain Anderson Funke, USPHS, M.D., was promoted to O-6 in October of 2002. Captain Funke is the Medical Director of the Carolina Health Centers in Greenwood, South Carolina.

Class of 1989.

Colonel John Baxter, USAF, MC, has served as the Commander of the Pentagon Flight Medicine Clinic for some years; he is also the physician to the Secretary of Defense. Several months prior to the terrorist attack, Colonel Baxter's clinic had conducted mass casualty training exercises in conjunction with the Pentagon DiLorenzo Clinic. The exercise simulated a plane crashing into the building; on September 11th, members of both health care facilities agreed that the simulated training had proven to be invaluable.

Class of 1990.

Lieutenant Colonel Bruce Adams, MC, USA, is currently serving as the Chief Resident, Department of Emergency Medicine, at the Medical College of Georgia in Augusta, Georgia.

Class of 1991.

Lieutenant Commander Michael Harrison, MC, USN, an anesthesiologist, recently served at the Forward Operating Base, Camp Rhino, in Afghanistan.

Major Paul Pasquina, MC, USA, serves as the Program Director for the Physical Medicine and Rehabilitation Residency at the Walter Reed Army Medical Center. Major Pasquina led the department through its residency review by the Accreditation Council for Graduate Medical Education (ACGME); formal results were released during 2002.

Lieutenant Colonel Bill Rice, MC, USA, is serving as the Director of Occupational Medicine, at the U.S. Army Center for Health Promotion and Preventive Medicine-Europe in Heidelberg, Germany.

Class of 1992.

Commander Noel Delmundo, USPHS, M.D., was promoted to O-5 during 2002. She is assigned as staff in the Obstetrics and Gynecology Department at the Phoenix Indian Medical Center in Arizona.

Lieutenant Colonel Erin Edgar, MC, USA, continued the trend of USU alumni serving in operational positions, when he assumed the position of Division Surgeon for the 82nd Airborne Division at Fort Bragg, North Carolina. Lieutenant Colonel Edgar has been twice promoted below zone.

Lieutenant Colonel Nelson Hager, MC, USA, serves as the Chief of the Physical Medicine and Rehabilitation Service at the Walter Reed Army Medical Center in Washington, D.C.

Lieutenant Colonel Mark Koeniger, USAF, MC, recipient of the Malcolm Grow Award for Air Force Flight Surgeon of the Year in 1998, serves as the Commander of the 86th Aeromedical Squadron at the Ramstein Air Base in Germany.

Commander Mary Porvaznik, M.D., USPHS, continues to serve as the Chief of Family Medicine at the Northern Navajo Medical Center in Shiprock, New Mexico. She supervises a department of 13 physicians who provide primary care in the Medical Center and in several community clinics outside of the Center. Besides a busy out-patient clinic, Commander Porvaznik's department also runs a busy in-patient adult and pediatric service, including an intensive care unit and full obstetrical services. Commander Porvaznik was born in the Indian Health Service Hospital in Tuba City, Arizona; her father was a physician who also served the Native American population. Commander Porvaznik's father, who completed 30 years in the Public Health Service and retired as an Assistant Surgeon General and Rear Admiral, suggested that she apply to USU. Commander Porvaznik reported that she realizes the intense training she received at the USU SOM was outstanding and the summer field training sessions were incredibly useful.

Class of 1993.

Commander Kimberly (Clancy) Brownell, USPHS, M.D., was promoted to O-5 during 2002. Commander Brownell is serving as a Staff Pediatrician at the Northern Navajo Medical Center in Shiprock, New Mexico.

Commander Jeffrey Curtis, USPHS, M.D., was promoted to O-5 during 2002. Commander Curtis is a Staff Physician in the Medicine/Family Practice Department at the Phoenix Indian Medical Center in Arizona.

Commander Brent Warren, USPHS, M.D., was promoted to O-5 during 2002. Commander Warren is an Assistant Professor and Ophthalmologist in the USU SOM Department of Surgery.

Major Grant Tibbetts, USAF, MC, is currently assigned as the Chief of Special Imaging at the 3rd Medical Group, Elmendorf Air Force Base, Alaska.

Class of 1994.

Lieutenant Commander Staci (Valenzuela) Kelley, MC, USN, serves as the Head of the Inpatient Mental Health Division of the Naval Hospital located at Great Lakes, Illinois.

Lieutenant Commander Charles McCannon, MC, USN, who recently completed the Preventive Medicine Residency Program at USU, passed the Certified MBA examination and was awarded the CMBA designation by the International Certification Institute. He is among the first group of MBAs to earn the distinction. He is one of only 86 Certified MBAs in the United States and Canada. (There are over two million MBA graduates in the United States and Canada, with over 100,000 new graduates each year.) The CMBA is the only professional certification designed to confirm an MBA's command of the common body of knowledge required across all accredited MBA programs.

Class of 1995.

Major Shean Phelps, MC, USA, is serving as the Battalion Surgeon for the 1st Special Forces Battalion, 1st Special Forces Group, Panzer Kaserne, in Boeblingen, Germany.

Class of 1996.

Captain Daniel Irizarry, MC, USA, is the Regimental Surgeon for the 325th Airborne Infantry Regiment, 82nd Airborne Division, at Fort Bragg, North Carolina. He graduated in June of 2000 from the Womack Army Medical Center Family Practice Program at Fort Bragg.

Lieutenant Commander John M. McCurley, MC, USN, an internist, is serving as a Staff Physician in the Office of the Attending Physician on Capitol Hill.

Lieutenant Commander Mark Michaud, MC, USN, is the Senior Medical Officer aboard the USS Emory S. Land, a submarine tender based at Lamaddalena in Sardinia, Italy.

Lieutenant Commander John Mohs, M.D., USPHS, is assigned to the Northern Navajo Medical Center in Shiprock, New Mexico; he is the Vice Chief of Family Medicine and the Director of the Family Medicine Health Clinic. As such, he is responsible for scheduling, developing and maintaining practice guidelines, and for conducting performance improvement studies; there are 13 physicians and 10 nurses assigned to the clinic.

Lieutenant Commander Kimberly Mohs, M.D., USPHS, is assigned to the Northern Navajo Medical Center in Shiprock, New Mexico; she is the Chief of Internal Medicine. As such, she oversees a department of six internists who provide primary care as well as cardiology and pulmonary related procedures and endoscopy. Her department also holds a number of specialty clinics, including hypertension, tuberculosis, renal disease, gastroenterology, and a uranium miners clinic which she also runs. The Four Corners area has been a primary site for uranium mining over the years, and the clinic mainly treats patients with lung disease or other health problems resulting from exposure to uranium.

Class of 1998.

Lieutenant Commander Robert Johnson, MC, USN, served as a Flight Surgeon assigned to VAQ-133 and the Naval Hospital in Oak Harbor, Washington. He was selected for an Ophthalmology Residency at the Naval Medical Center in San Diego, California, in June of 2003.

Captain Jocelyn Kilgore, USAF, MC, completed her Psychiatry Residency and is now assigned as a Staff Psychiatrist in Germany.

Lieutenant Commander David Lesser, MC, USN, serves as a Flight Surgeon with the Navy Helicopter Squadron HSL-41 in San Diego, California.

Captain Christopher Lettieri, MC, USA, served as the Chief Resident in the USU SOM Department of Medicine for the 2001-2002 Academic Year.

Class of 1999.

Lieutenant Kimberly Fagen, MC, USN, is assigned as a Flight Surgeon to the Commander, Carrier Air Wing 9. When not deployed, Lieutenant Fagen is based at the Naval Branch Medical Clinic, Naval Air Station North Island, in San Diego, California.

Class of 2000.

Lieutenant John Ringquist, MC, USN, is stationed at Lamaddalena in Sardinia, Italy, where he is serving as the Undersea Medical Officer on board the USS Emory S. Land.

Class of 2001.

Lieutenant Kenneth Terhaar, MC, USN, is assigned as a General Medical Officer with the 3rd Medical Battalion, Bravo Company, in the 3rd Fleet Service Support Group at Okinawa, Japan. He previously completed his internship at the Naval Medical Center in San Diego, California.

Selected Profiles of USU School of Medicine Graduates.

Army.

Lieutenant Colonel James Ecklund, MC, USA, USU SOM Class of 1987, serves as the Chief of the Walter Reed Army Medical Center's (WRAMC) Neurosurgery Service, the Residency Program Director at the National Capital Consortium, and as the Chief of the Division of Neurosurgery, in the USU SOM Department of Surgery.

By virtue of their jobs, United States Service Members around the world are at risk of life-threatening injuries. Whether fighting enemy forces in austere locations, jumping from aircraft during real-world events or at training exercises working with heavy equipment and weapons, troops face possible brain and spinal cord injuries. The Defense and Veterans Brain Injury Center (DVBIC) and the USU Neurotrauma Research Laboratory encompass research on the care of veterans and family members with neurotrauma injuries as well as comprehensive basic and clinical research on brain and spinal cord injuries - a leading combat casualty. The USU Neurotrauma Research Laboratory was initiated five years ago to study brain and spinal cord injuries to military members during combat and under austere conditions. Lieutenant Colonel Ecklund co-directs the program. According to Ecklund, "there is great research already being conducted in the civilian community for the hospital treatment of head and spinal cord injury resulting from common mechanisms seen in a civilian setting. In contrast, those of us in uniform have a vested interest and a responsibility to address the questions related to caring for neurologically injured soldiers, sailors, airmen, and Marines in a battlefield environment." For example, 80 to 90 percent of head injuries seen in a combat environment are penetrating injuries, whereas 80 to 90 percent of head injuries in the civilian sector are closed. While there are many robust research efforts investigating questions related to closed head injury in this country, there is no substantial basic science research being conducted on penetrating injuries. Additionally, the austere nature of the battlefield combined with resource limitations and delays in evacuation create an environment almost never encountered in the civilian sector. Two promising technologic devices under study are a radio frequency triage tool, *RAFT*; and, a wearable comprehensive physiologic monitor, called a *BioGlove*. Based on radio wave interrogation, *RAFT* has been developed to noninvasively image the brain and spinal cord. This device has been developed in collaboration with Biostaf and RGR, a civilian engineering consortium. Evaluation of this device on an intact physiologic level is being conducted at USU. The *BioGlove*, which is worn as a glove by the user, provides real-time information on EKG, respiratory rate, heart rate, pulse oximetry, and body temperature. It also has the potential for integration with *RAFT*. If research data proves to be promising, a clinical trial will follow. Lieutenant Colonel Ecklund agrees that there must be an ongoing commitment to scientific research to ensure that appropriate advancements in medical care will be available for our country's most deserving patients - those who have been injured in her defense. *Ecklund finds conducting research for the soldier in the neurotrauma laboratory especially meaningful because the research is filling a large gap that is clearly mission relevant.* One of Ecklund's recent cases as a neurosurgeon included an 11-year-old boy who had been partially paralyzed on his left side for two years. Ecklund performed a craniotomy, exposing an aneurysm. The young patient was put on a bypass and his body temperature lowered to 64.4 degrees

Fahrenheit, stopping his heart. It took the surgical team 37 minutes to successfully complete the reconstruction using five aneurysm clips. The patient's left hemiparesis resolved and he is progressing well in school. Finally, as the Residency Program Director, Ecklund considers it an honor to guide and train the next generation of military neurosurgeons. "We have incredibly talented, bright and motivated residents; and, being part of their development is an honor." (USU Medicine, Fall 2002, pages 14-17.)

Navy.

Captain John Perciballi, MC, USN, USU SOM Class of 1983, is based at the Pensacola Naval Hospital. *CNN News* reported on the work of Navy doctors who were travelling with the United States Marines on the front lines of the war in Iraq. The doctors, part of a shock trauma platoon, worked in a mobile operating room, under austere conditions, performing surgery on soldiers and Iraqis alike. Captain Perciballi, the unit's Chief Surgeon and a Clinical Assistant Professor at USU, made it clear to the reporters that the most severely wounded front-line fighters are treated first, whether they be allies or enemies. Because of the austere circumstances and temporary facilities, the surgeons had to carefully pick and choose those critically injured patients who had to be taken care of first. The scope of their work rivals any large trauma center in the United States.

Commander Bruce Baker, MC, USN, USU SOM Class of 1986, is an anesthesiologist. His work was covered in an Associated Press article dealing with the *golden hour* of trauma for United States Navy surgeons in Iraq. USU SOM alumnus Commander Bruce Baker demonstrated his knowledge of operational medicine; he also reported to USU from the field in Afghanistan in the inaugural issue of USU Medicine in the Winter issue of 2002. Commander Baker was quoted in the Associated Press article about his ability to provide a high level of care in medical tents in host, dusty southern Iraq, although he had to work with different equipment, including a portable oxygen generator, blood-gas monitor and devices to warm fluids going into the patients. He served as a member of a forward resuscitative surgical systems team, operating for the first time in combat. With seven years in the design phase, the forward surgical units are truly mobile and replace ones that would have required a transport plane and landing field to move. This surgery team can move using four trucks and can set up or tear down in one hour. The unit includes two surgeons, an anesthesiologist, a nurse, operating technicians and corpsmen who are able to handle as many as 18 patients in a 24-hour period. As expected, the doctors treat all critically wounded people, whether they are Iraqi, American, or British. These patients represent 15 to 20 percent of those wounded in battle who would otherwise die if critical care were not provided within the first hour. Commander Baker described it as *damage-control surgery* and, for the Iraqis in particular, immediate surgery stemmed blood loss and led to their survival.

Air Force.

Lieutenant Colonel Bill Beninati, USAF, MC, USU SOM Class of 1988, is a pulmonologist and the Medical Director of the Air Force CSTARS Program at the R. Adams Cowley Shock Trauma Center in Baltimore, Maryland. The 210-bed freestanding hospital sees between 6,500 and 7,000 patients annually, 100 percent of whom arrive via state police helicopters, paramedic ambulances, or via transfers from intensive care units at other hospitals. Lieutenant Beninati, along with other USU SOM graduates, believes that while a separate program should be maintained for each Service, shared goals that include ensuring that military medical professionals have clinical skills necessary to sustain themselves on the battlefield and are adequately prepared to work together as a team in combat are critical to medical readiness. The CSTARS - Coalition for Sustainment of Trauma and Readiness Skills - Program is comprised of 14 full-time Air Force staff members. In addition to Beninati, there are six physicians (including *Major Jeffrey Johnson, USAF, MC, USU SOM Class of 1993, a Trauma Surgeon; and, Major Shawn Varney, USAF, MC, USU SOM Class of 1993, an Emergency Physician*); a nurse anesthetist; intensive care unit, trauma, and operating room nurses; two medical technicians; and, one administrative officer. During the past few years, the Readiness Skills Verification Program, or RSVP, was established; and, one of its major tasks was to develop a list of critical skills that health care providers would need when deployed, so they could hit the ground running in the combat theater of operations. The end result was that a significant gap was identified between required battlefield skills and those that health care providers actually possessed. Indeed, only 20 percent of the active duty physicians in the Air Force, the USU alumni, have received similar training during medical school. The solution was CSTARS. The Air Force CSTARS Program only trains active duty service members. In addition to the program's role in enhancing clinical skills, Beninati said they are aiding in homeland security, providing teaching assistance through international engagement missions, and conducting research.

United States Public Health Service.

Captain Karen Parko, M.D., USPHS, USU SOM Class of 1991, was promoted to O-6 in July of 2002. Captain Parko is the Chief of Neurology Services for the Northern Navajo Medical Center in Shiprock, New Mexico. She is also the sole neurologist for the Indian Health Service in the lower 48 United States. Commander Parko frequently travels to other service units on the Navajo reservation to help with neurology services and to educate other physicians in the care of neurological problems and she has also established specialty seizure and Parkinson's clinics for the area patients. Commander Parko runs a neurodiagnostic laboratory and performs nerve conduction studies and electromyography, as well as electroencephalograms. Dr. Parko has pointed out that her experience at USU provided her with a good overview of medicine and how it can be applied in different settings; the wide scope of medicine taught at the USU SOM has left her prepared to handle multiple medical situations outside of her specialty. Commander Parko's responsibilities also include administrative committee work in addition to serving as a

neurology tort claim reviewer for the Public Health Service. Captain Parko was one of only 18 officers selected by the Division of Commissioned Personnel of the United States Public Health Service for the 2002 Exceptional Capability Promotion.

FACULTY OF THE SCHOOL OF MEDICINE.

Composition. As of November 2002, the School of Medicine had 310 full time assigned faculty members: 200 civilians; and, 110 uniformed officers. There are approximately 3,902 non-billeted or off-campus faculty who assist in the USU programs of which 1,154 are civilians and 2,748 are uniformed officers.

SOM Clinical and Consultative Services Generate an Estimated \$10,028,720 in Cost Avoidance for DoD in Fiscal Year 2002. The affiliated Medical Treatment Facilities (MTFs) in the National Capital Region (the National Naval Medical Center (NNMC), the Walter Reed Army Medical Center (WRAMC), and the Malcolm Grow Air Force Medical Center (MGMC) use the services of the USU faculty for the provision of health care.

The USU SOM civilian and military clinical faculty members, as a part of maintaining their credentials and level of proficiency, provide medical services and consultation to the hospital patients and staff and teach and supervise residents. In order to meet national accreditation standards, all teaching hospitals must provide both patient care and teaching/supervision of medical students, interns, and resident physicians. Cost avoidance in the Department of Defense (DoD) is generated by the hours of clinical service and medical expertise provided by the USU civilian and military faculty. Thirteen USU SOM academic departments (Anesthesiology, Dermatology, Family Medicine, Department of Medicine, Military and Emergency Medicine, Neurology, Obstetrics and Gynecology, Pathology, Pediatrics, Preventive Medicine and Biometrics, Psychiatry, Radiology and Radiological Sciences, and Surgery) provided clinical and consultative support to DoD that totalled some 138,358 hours in 2002, with an estimated cost avoidance of \$10,028,720.

Without the patient care and special services provided by the USU SOM faculty throughout the DoD medical facilities, the military hospitals, clinics, and other facilities would find it necessary to augment their medical staffs by 138,358 work hours in order to maintain the level of patient care within the direct care system.

USU SOM Faculty Achieve National and International Recognition. The SOM faculty members are regularly selected to serve on various study sections for the National Institutes of Health and for other research-granting agencies. Many faculty members, due to their national/international reputations are: 1) selected for editorial boards; 2) designated to serve as consultants or advisors to the White House, the Office of the Secretary of Defense, international schools of medicine (e.g., China, France, Japan, Mexico, Poland, Russia, Thailand, etc.), and numerous Federal Agencies; 3) requested to give invited lectures and to serve on Federal, national, and international committees; and, 4) recognized as senior officers in a wide

variety of professional organizations. A number of basic science and clinical faculty hold senior and deputy editor positions on journals representing their disciplines and specialties. Overall, the SOM faculty has clearly achieved recognition with its peers across disciplines and specialties. USU SOM faculty are routinely chosen to serve on university, military, and Federal and professional organization committees in a variety of leadership and service capacities. Due to the unique nature of the USUHS SOM mission and certain of its departments, faculty in the Departments of Military and Emergency Medicine, Preventive Medicine and Biometrics, Psychiatry, and Medical History have achieved national and international recognition (Appendix C provides examples of individual achievements and recognition).

The majority of SOM clinical faculty are located at the teaching hospitals. The large number of enthusiastic, well-trained primary care and specialist clinicians, based at the hospitals throughout the Military Health System, is an invaluable resource for teaching medical students. Under the oversight and guidance of clinical clerkship directors, this large faculty does an excellent job of medical student clinical training, based on surveys of both students and department chairs. A number of the hospital-based faculty are also involved in clinical research programs through the active clinical investigation programs based at the teaching hospitals. To further enhance communication and cooperation between the USU SOM and its affiliated teaching facilities, the Office of the Associate Dean for Clinical Affairs maintains an updated series of memoranda of understanding between the University and its affiliated teaching and research institutions that clearly defines areas of responsibility and accountability. Outcome data such as student-reported satisfaction, student performance on National Board examinations, hospital commanders' overall satisfaction with the performance of USU graduates, and the large percentage of operational and leadership positions held by USU graduates throughout the Military Health System, indicate that the SOM faculty is performing a stable and highly satisfactory job of educating medical students for the Uniformed Services.

Collaborative Efforts.

Teaching. Cooperation in teaching has been systematically developed within the departments, between departments, and within subspecialties, to improve the educational experience of both medical and graduate students (the SOM faculty also provides the instructional base for the Graduate Education Programs at the University). The composite curriculum in behavioral sciences, drawing on Neurology, Psychiatry, and Medical Psychology, is a significant example of interdepartmental cooperation in undergraduate medical education.

The graduate programs in Neuroscience, Molecular and Cell Biology, and the newly established Interdisciplinary Graduate Program in Emerging Infectious Diseases illustrate a sound cooperative relationship in research and graduate education. The Tumor Biology Program, an interdepartmental effort between the Departments of Pathology and Surgery, serves as a bridge between basic science and clinical practice in Medical Oncology. The special interest groups in curriculum studies have resulted in basic science input into the hospitals, with collaboration in research, and more importantly, with collaboration in teaching, as the basic scientists provide science instruction to the medical house officers and junior faculty within certain subspecialties of mutual interest. In addition, faculty members use electronic mail and computer bulletin boards quite extensively, which also enhances their collaborative efforts throughout the Military Health System.

The Department of Anatomy, Physiology and Genetics. A significant change took place over the past three years in the academic structure of the USU SOM. The Department of Anatomy and Cell Biology and the Department of Physiology were formally merged to create the Department of Anatomy, Physiology and Genetics (APG). The philosophy of the newly formed department conforms with the mission and goals of the USU Strategic Plan. The philosophy is based upon a commitment to the highest level of excellence in teaching, research, and administration. The departmental merger has consolidated the teaching, research, and administrative functions of a substantial component of the University within a single faculty group under the leadership of a single Department Chair. Integration of the formerly separate anatomy and physiology curricula is resulting in a single, cohesive and dynamic educational experience that spans the entire first year of medical education. As expected, the departmental merger is yielding benefits beyond the immediate outcomes of curriculum integration.

A goal of APG is to integrate the “information explosion” resulting from the Human Genome Initiative and a myriad of cellular and molecular biological approaches, so that biomedicine explains how *the human body functions as an integrated self-regulating system. The systems biology approach is seen as a means to further improve the information transfer process for the major responsibility of APG - the education of USU medical and graduate students.* The Basic Anatomy and Physiology Courses have been integrated and are providing students with a comprehensive understanding of tissue and organ function. The APG faculty members oversee courses that extend for the entire first academic year; in fact, first-year medical students spend approximately 53 percent of their first year of medical education with APG faculty. APG has organized its basic instruction into three modules. *Introduction to Structure and Function* introduces the student to cell classification, organelle function, and cellular processes, followed by study of the gross anatomy of the human body. An emphasis is placed upon understanding anatomical relationships and the causes and functional consequences of anomalies arising from disease processes. Gross anatomical study of the head and neck region, neuroanatomy, and basic clinical neurology are taught in the second module: *Clinical Head and Neck and Functional Neuroscience*. Finally, the students return to cellular and subcellular analysis in the third module: *Structure and Function of Organ Systems*. This module presents an integrated approach to understanding the functions of different cells and organ systems, which includes: the functions of muscle; heart; endocrine systems; kidney; respiration; gastrointestinal physiology; hematology; and, reproduction.

The Department oversees other educational programs for medical and graduate education. In addition to faculty participation in graduate courses offered by various Ph.D. Programs at the University, APG faculty members, in a collaborative project with the National Naval Medical Center (NNMC) Department of Anesthesiology and the USU SOM Department of Anesthesiology, operate the Patient Simulation Laboratory (PSL). Since its inception in 1997, the PSL has created and presented patient simulation-based clinical education for USU students as well as for clinicians from local military treatment facilities. To extend the reach of the simulation-based education, the PSL recently installed an ultra-high speed Internet-2 Advanced Distance Education Network throughout USU with links to NNMC and the National Library of Medicine. APG faculty are also active members of two USU interdisciplinary programs: the Molecular and Cell Biology and the Neuroscience Graduate Programs. Many graduate students in these programs are undertaking their thesis research in APG laboratories. Future educational initiatives are in the planning stage. APG faculty members are preparing a Clinical Genetics Curriculum that will be an addition to the clinical course instruction of the fourth-year medical students.

The newly integrated Department, with over 100 members, offers wide-ranging, varied and collaborative research programs; and, these research programs study many fundamental biological problems. The APG faculty members employ a wide range of anatomical, electrophysiological, biochemical, cellular and molecular biological methods to address medical problems associated with neurodegenerative disorders, such as: Multiple Sclerosis; Parkinson's Disease and Alzheimer's Disease; Down Syndrome; Canavan Disease; and, central and peripheral nerve injury. Faculty members also have active research programs in hypertension and cardiovascular pathophysiology, neuroimmune responses of gastrointestinal function, and understanding metabolic disorders such as Cystic Fibrosis and Diabetes. Studies within the Department focus on: the regulation of neuronal gene expression; biological clock mechanisms; neuroendocrine secretory processes; the role of glial cells in CNS injury and disease; and, neuronal regeneration and plasticity. Several programs employ state-of-the-art approaches, to include: cell therapy using engineered cells; gene therapy using viral and chemical vectors; knock-out and transgenic mouse models; and, microarray and mass spectrometry technologies. The Department's research funding is supported by the National Institutes of Health, the National Science Foundation, the United States Air Force, the Juvenile Diabetes Foundation, the Cystic Fibrosis Foundation, the Department of Defense/Veterans Head Injury Program, as well as the USU Intramural Grants Program. In Fiscal Year 2002, APG research grant funding exceeded 8.8 million dollars.

Interdisciplinary Research Programs. The research and development goals of the USU strategic plan are to build, sustain, and publicize interdisciplinary research programs relevant to the needs of the Uniformed Services. In addition to the above-described research in the newly integrated Department of APG, there are three interdisciplinary research programs at USU: 1) **Emerging Infectious Diseases.** Initially, a special interest group from the USU SOM Departments of Microbiology and Immunology and Preventive Medicine and Biometrics, to include faculty from other departments who are interested in infectious diseases, began meeting and successfully submitted a proposal for an NIH training grant in this area. This effort led to the establishment of the Emerging Infectious Diseases (EID) Graduate Program in 2000. The EID Program has three academic tracks within the field of emerging infectious diseases: microbiology and immunology; pathology; and, preventive medicine/parasitology, with primary interest in the pathogenesis, host response, pathology, and epidemiology of infectious diseases. The research training emphasizes modern methods in molecular biology, cell biology and interdisciplinary approaches. The inaugural graduate student class of ten students matriculated in the Fall of 2000; ten students entered the EID Program in 2001; and, eleven students were enrolled in the Fall of 2002. **Eleanor S. Metcalf, Ph.D., Professor, USU SOM Department of Microbiology and Immunology,** is the Program Director; she can be contacted by e-mail at <emetcalf@usuhs.mil> or at <www.usuhs.mil/mic/eid.html>; 2) **Molecular and Cell Biology.** An Interdisciplinary Program, in Molecular and Cell Biology (including Genetics), was developed in 1993 to contribute to cross-disciplinary interactions and to develop critical skills needed for data presentation and analysis; the program also includes a seminar series and a journal club, all of which support the Ph.D. Program. This interdisciplinary Ph.D. Program offers training to address many of the fundamental questions of modern biology ranging from protein-nucleic acid interactions to cytokines, growth factors, and developmental biology. Research areas include molecular biology of lymphocyte interactions; host-pathogen interactions; cell surface, cytoplasmic and nuclear receptor signaling pathways, exocrine secretory processes, and gene targeting in mice to include a transgenic mouse facility for targeted gene disruption using homologous recombination. **Jeffrey M. Harmon, Ph.D., Professor, USU SOM Department of**

Pharmacology, was appointed as the third Director of the Molecular and Cell Biology (MCB) Program; he oversees the studies of 17 MCB students and coordinates with over 40 MCB faculty members. He can be contacted by e-mail at <jharmon@usuhs.mil> or <www.usuhs.mil/mcb/index.html>; and, 3) **Neuroscience**. The Interdisciplinary Program in Neuroscience and its Ph.D. Graduate Program are supported by faculty members whose primary appointments are established throughout the SOM departments. It provides a seminar series, and flexible program of courses and research areas for graduate students and postdoctoral fellows. Research areas strongly represented by faculty include: development, regeneration, and plasticity in the nervous system; molecular neurobiology; and, adaptive responses of the nervous system to stress, injury, and a changing environment. Integrated interdisciplinary instruction in the development, structure, function, and pathology of the nervous system and its interaction with the environment is also included. Three students entered the program, including one Medical Doctor/Doctor of Philosophy student, in the Fall of 2002. **Regina C. Armstrong, Ph.D., Professor, USU SOM Department of Anatomy, Physiology and Genetics**, is the Director of the Neuroscience Program; there are currently 17 students enrolled and over 40 participating faculty members; Doctor Armstrong can be contacted by e-mail at <rarmstrong@usuhs.mil> or at <www.usuhs.mil/nes/home.html>.

Selected Profiles of USU School of Medicine Faculty.

USU SOM Dean Retires on May 19, 2002.

Tomorrow, on May 18, 2002, following the graduation ceremonies at the School of Medicine, Doctor Hemming will mark the end of his 37-year career in Federal service... As Dean, Doctor Hemming has worked to further the established mission and goals of the USUHS School of Medicine. Under his leadership, the University has continued to provide the Nation with highly qualified health professionals dedicated to career service in the Department of Defense and the United States Public Health Service. These graduates leave USUHS trained to provide continuity in ensuring medical readiness and the preservation of lessons learned during combat and casualty care. This critical role is, in fact, the significant factor that led the Congress to establish USUHS in 1972.

- **The Honorable Paul S. Sarbanes, the United States Senate, Congressional Record, Tribute to Val G. Hemming, M.D., May 17, 2002, page S4533.**

During 2001, **Val G. Hemming, M.D., USU SOM Professor and Dean Emeritus**, announced his retirement date of May 19, 2002. Appointed in May of 1996, Dean Hemming replaced *Nancy E. Gary, M.D., who had served as the second Dean of the School of Medicine from 1992 - 1995*. Dean Hemming had previously held the position of Chair, Department of Pediatrics, since his retirement from the Air Force in October of 1990 through May of 1996. Dean Hemming was first assigned to the Department of Pediatrics in 1980; while on active duty, he was appointed as Chair of Pediatrics in 1987. From 1983 through 1990, he also served as the Specialty Consultant in Pediatrics to the Air Force Surgeon General; and, from 1987 through 1990, he served as the Consultant in Pediatrics to the Assistant Secretary of Defense for Health Affairs. His academic and research interests have included the pathogenesis of Lancefield group B streptococcal infections in the neonate, pathogenesis of lower respiratory tract bacterial and viral infections in infants and young children, and pediatric education for undergraduate medical students. *Most significant has been his research in Respiratory Syncytial Virus (RSV) Infection; this research resulted in a biological product for the prevention of RSV infection for children, which was approved by the Food and Drug Administration in January of 1996.* Dean Hemming was awarded the Doctor of Military Medicine, *Honoris Causa*, at the USU Commencement on May 19, 2001. The citation for the honorary degree recognized Dean Hemming as a physician, teacher, scientist, military officer, humanitarian, husband, father, and grandfather. Also, the University award recognized Dean Hemming's "lifetime of pursuing multiple goals... always guided by a core principle of service... to family, church, and country..." Dean Hemming changed the SOM curriculum through a caring and thoughtful style of management and, by doing so, ensured the accreditation of the SOM by its accrediting organizations. The University's gratitude toward Dean Hemming for his accomplishments and contributions to the SOM and to the entire University is reflected in the standing ovation paid to him as he accepted the Honorary Degree of Doctor of Military Medicine. *Dean*

Hemming, the third USU SOM Dean and Professor Emeritus, is currently working on his research and serves as a voluntary faculty member in the USU SOM Department of Pediatrics.

USU SOM Selects its Fourth Dean. Following a nation-wide search, *Captain Larry W. Laughlin, M.D., Ph.D., USN (Retired)*, was chosen to be the fourth Dean of the SOM. Doctor Laughlin joined the University in 1991 and served as the Chair of the SOM Department of Preventive Medicine and Biometrics from 1998 through 2002, where he held the Sanford Chair in Tropical Medicine, named in honor of *the first Dean of the SOM, Jay P. Sanford, M.D.* Doctor Laughlin is certified by the American Board of Preventive Medicine and the American Board of Internal Medicine, Public Health and General Preventive Medicine. Prior to his USU assignment, he was the Commanding Officer of the Naval Medical Research Institute in Bethesda, Maryland. Captain Laughlin retired from active duty in the Navy and assumed responsibilities as Dean of the SOM on May 19, 2002. Since that time, Dean Laughlin has met extensively with his Department Chairs and Associate Deans to review the structural organization of the SOM to ensure that the Medical School has the flexibility to respond to the ever-changing requirements of the Military Health System. As Dean, Doctor Laughlin remains firm in his conviction that continued excellence in teaching is essential to the medical and graduate education students in the SOM. He has initiated a SOM-wide effort to enhance the teaching skills of the faculty through expanded mentorship, which, in turn, will enrich the experience of the SOM and Graduate Education students; Dean Laughlin currently participates in teaching SOM students. And, relevant to his expansive research experience and the successful publication of his related efforts, Dean Laughlin is also working with the Department Chairs and the USU Vice President for Research to assist new/junior faculty members with the complex requirements of the research application process through mentorship and instructional workshops. In addition, the new Dean has closely coordinated with the USU Vice Presidents for Administration and Management, Resource Management, and Research to develop and implement a year-round process leading to the eventual renovation of the research laboratories throughout the School of Medicine. These efforts are all part of Dean Laughlin's vision to enhance the teaching, research, and scholarship achievements of the SOM faculty.

USU Department Chair Is Recognized for 25 Years of Extraordinary Leadership. **Norman M. Rich, M.D., Professor and Chair, Department of Surgery**, has provided leadership to the USU SOM Department of Surgery beginning in 1977, when he established the Department. Despite resource constraints and repeated threats against the University and the School of Medicine, Doctor Rich attracted and retained talented faculty, successfully developed a military medical surgical curriculum, and initiated a research program. One of his most successful innovations was to establish a bi-monthly Distinguished Visiting Professor Program that has continuously benefitted students and introduced nationally and internationally known surgeons to the University and to the outstanding student body of the School of Medicine. Another unique innovation established by Doctor Rich was the USU Surgical Associates, which served as a model for the founding of the Henry M. Jackson Foundation for the support of medical education and research. On August 21, 2001, Doctor Rich was awarded the University Medal during the 16th Annual

Surgery for Trauma Day. The award recognized Doctor Rich for: the continuous support and encouragement he has provided to the faculty, students and graduates of the SOM; his contributions to the positive awareness of the University through his international efforts and memberships in elite organizations; and, the on-going visits to USU by prestigious organizations. Two examples include the Society of University Surgeons (this premier organization for young academic surgeons has held two meetings at USU; whereas, the majority of United States medical schools have never been visited) and, the International Surgical Group composed of Professors from leading Canadian, British, Scandinavian, and United States Schools of Medicine. Doctor Rich also established: the American Trauma Society; the Society for Military Vascular Surgery; the Chesapeake Vascular Society; the Southern Association for Military Surgery; the American Venous Forum Foundation; the Ambroise Pare International Military Surgery Forum; and, the International Association of Trauma Surgery-Intensive Care. He has been a member of more than 56 professional societies. Due to his academic interest in the management of injured patients and vascular surgery, Doctor Rich has earned international recognition, lecturing in more than 35 countries, publishing in excess of 300 manuscripts and authoring or co-authoring five books. He has also received more than 50 awards and honors, to include: the Legion of Merit; the Bronze Star; the Republic of Vietnam Gallantry Cross; and, the Vietnam Service Medal. *On October 11, 2002, the University President announced that the Department would be named the Norman M. Rich Department of Surgery.* Doctor Rich stepped down as Chair of the Department in late October of 2002; he remains on the faculty and continues to provide consultative support to **Colonel David Burris, MC, USA, FACS, DMCC, USU SOM Class of 1982**, who has been named as Interim Chair of the Department of Surgery.

USU Chair Receives \$12.7 Million, Seven-Year Award from the National Institutes of Health. **Harvey B. Pollard, M.D., Ph.D., Professor and Chair, USU SOM Department of Anatomy, Physiology and Genetics (APG)**, is the principal investigator for a National Institutes of Health (NIH)-sponsored study on the proteomics of cystic fibrosis. The award totals \$12.7 million over a seven-year period. Under the leadership of Doctor Pollard, *the USU SOM APG Center for Medical Genomics and Proteomics has become one of ten academic organizations in the United States to win substantial support from the NIH for the establishment of a Proteomics Center.* This contract has allowed the University to acquire a world-class set of mass spectrometers, as well as support personnel, to form the critically required technical support base for proteomic research in the 21st Century. *In terms of NIH funding, this moves the USU SOM Department into the ranks of the top twenty equivalent Departments in United States Medical Schools* and also serves as a crucial research resource for the entire University. The goal of the Center is to identify proteins whose expression and function are significantly increased or decreased in cystic fibrosis. The rationale is that the identification of such proteins will provide critical information for the development of new clinical diagnostics and the discovery of new drugs with which to treat cystic fibrosis. Cystic fibrosis is the most common autosomal recessive lethal genetic disease affecting the population of the United States, with one out of every 1,600 live births afflicted. A cystic fibrosis patient carries two copies of a mutant cystic fibrosis transmembrane conductance regulator (CFTR) gene, and approximately five percent of the population carries at least one mutant CFTR gene. The average cystic fibrosis patient dies at the age of 28, primarily through lung inflammation, infection, and failure. Information derived from this research promises to impact on the understanding of challenging, but less understood, inflammatory diseases of the lungs

such as asthma, as well as inflammatory processes in other parts of the body. Faculty co-investigators and consultants at USU include **Gregory P. Mueller, Ph.D., Professor, APG; David Jacobowitz, Ph.D., Adjunct Professor, APG; Meera Srivastava, Ph.D., Associate Professor, APG; Ofer Eidelman, Ph.D., Research Assistant Professor, APG; and, Eleanor S. Metcalf, Ph.D., Professor, Microbiology and Immunology.** The Center for Medical Genomics and Proteomics is the armature for the NIH-funded program and provides a world-class mass spectrometry facility located in the USU Biological Instrumentation Center (BIC).

Department Chair Receives Lifetime Distinction Award. Robert E. Goldstein, M.D., Professor and Chair, USU SOM Department of Medicine, was named a Master of the American College of Physicians (ACP) - American Society of Internal Medicine (ASIM). He was one of 34 internists nationwide honored during the ACP-ASIM annual convocation in Philadelphia, Pennsylvania, in the Spring of 2002. The Lifetime Achievement Distinction Award is based on many years of service to internal medicine. The award permanently entitles Doctor Goldstein to use the initials *MACP* as part of his professional signature. Doctor Goldstein was nominated for this award by the Metropolitan Washington, D.C. Chapter of the American Society of Internal Medicine. In addition to Doctor Goldstein, two current members of the Faculty of the USU SOM Department of Medicine were also among the 34 internists honored: **Kurt Kroenke, M.D., Adjunct Professor of Medicine;** and, **Michael Kussman, M.D., Adjunct Associate Professor of Medicine.** Both were named Masters in the ACP-ASIM. **Robert J.T. Joy, M.D., Professor and Chair Emeritus, USU SOM Department of Military History,** delivered a special address at the meeting.

The American College of Obstetricians and Gynecologists Recognizes USU SOM Chair. The American College of Obstetricians and Gynecologists Distinguished Service Award was presented to **William H.J. Haffner, M.D., Professor and Chair, USU SOM Department of Obstetrics and Gynecology.** The award was presented at the Presidential Inauguration and Convocation of the 50th Annual Clinical Meeting of the American College of Obstetricians and Gynecologists (ACOG). The event was held at the Los Angeles Convention Center on May 8, 2002. Doctor Haffner, a retired career United States Public Health Service (USPHS) medical officer, served as Chair of the USU SOM Department of Obstetrics and Gynecology (OB/GYN) for almost nine years before retiring from the USPHS on August 1, 2001; he was selected to continue as Professor and Chair of the USU SOM Department of OB/GYN in his new capacity as a civilian employee. Doctor Haffner maintains his clinical practice at the National Naval Medical Center in Bethesda. He began his USPHS career with the Indian Health Service in 1971, where he served in OB/GYN leadership roles. Doctor Haffner is active in the Armed Forces District of the ACOG and has served, or is currently serving, on several ACOG committees, including the Committee on American Indian Affairs, the Committee on Practice Bulletins-Gynecology, and the Committee on Health Care for Underserved Women. Doctor Haffner is also the Secretary-Treasurer-Elect of the Association of Professors of Gynecology and Obstetrics.

Robert J. Ursano, Professor and Chair, USU SOM Department of Psychiatry, Director, USU Center for the Study of Traumatic Stress, and internationally recognized expert on Post Traumatic Stress Disorder and mass psychological response to terrorism, was the keynote speaker at a National Academy of Science Workshop on the Psychological Consequences of Terrorism and Systems for Response. Doctor Ursano is a member of the National Academy of Science Institute of Medicine Committee on Responding to the Psychological Consequences of Terrorism; the committee will meet over twelve months to: address the gaps in the knowledge required by policy-makers for planning, preparedness and intervention and, provide recommendations for options on how to optimize the public health response to the long- and short-term mental health consequences of terrorism. During 2002, Doctor Ursano was appointed to the expert Advisory Board of the National Partnership for Workplace Mental Health; this is a partnership of the American Psychiatric Association and a number of the largest corporations in the United States. He was also asked to serve on the planning committee for the Annual Rosalynn Carter Symposium on Mental Health Policy. The 2002 theme was *Status Report - Meeting the Mental Health Needs of the Country in the Wake of September 11.*

Department Chair Develops the MedPix Medical Image Database System. James G. Smirniotopoulos, M.D., Professor and Chair of the USU SOM Department of Radiology and Radiological Sciences, and Professor of Neurology, and Biomedical Informatics, began an exciting Distance Learning Program by providing monthly Neuroradiology Teleconferencing between USU and the Naval Medical Center in San Diego, California. Working with the USU Office of Technology Transfer, Doctor Smirniotopoulos filed a patent application for the MedPix Medical Image Database System. The MedPix System is now used by all Department of Defense Radiology Residency Programs and it is the primary teaching file for: the National Naval Medical Center (NNMC); the Walter Reed Army Medical Center (WRAMC); the Tripler Army Medical Center in Honolulu, Hawaii; the Madigan Army Medical Center in Tacoma, Washington; and, USU. The MedPix Case of the Week is distributed by e-mail to more than 1,700 registered users each week, as well as to USU students across all four years of the School of Medicine. Significantly, Doctor Smirniotopoulos was designated responsibility for the *Neuroradiology Case of the Day* at the world's largest Radiology Meeting, the Radiological Society of North America, held in December of 2000. In addition, in February of 2002, he was a *Featured Faculty Member* in meetings held in Mexico City. He also participated in numerous continuing medical education courses around the Nation, as well as one week as a Visiting Professor at the Tripler Army Medical Center in Honolulu, Hawaii. Under his guidance, Doctor Maurice Reeder completed a DoD-sponsored project to create a comprehensive website on Tropical Imaging. Together, Doctors Reeder and Smirniotopoulos have begun a *Teach the Teachers* project, which will be used to train African Radiologists in Tropical Imaging.

Department Chair is Selected for the USU SOM Department of Preventive Medicine and Biometrics. **Captain Gerald V. Quinnan, Jr., M.D., USPHS,** was selected to chair the Department of Preventive Medicine and Biometrics following a nation-wide search. Captain Quinnan succeeded Doctor Larry Laughlin, M.D., following his selection as the Dean of the SOM. Captain Quinnan came to USU in 1993; he holds academic appointments in the School of Medicine as a Professor of: Preventive Medicine and Biometrics; Molecular and Cell Biology; and, Emerging and Infectious Diseases. He is an expert in virology and infectious diseases and has served as a member of the Department of Defense Select Panel on Biological Warfare Vaccine Research and Development; in addition, he serves as a consultant to the Pan American Health Organization, the World Health Organization, and the Centers for Disease Control and Prevention. Captain Quinnan is also a Fellow of the Infectious Disease Society of the American Board of Internal Medicine.

Paul D. Rick, Ph.D., Professor of Microbiology and Immunology, Has Been Appointed as the Chair of the USU SOM Department of Biochemistry and Molecular Biology. After more than 25 years as a faculty member at the USU SOM, **Paul Rick, Ph.D.,** was selected to lead the Department of Biochemistry and Molecular Biology. Doctor Rick joined USU in 1977, after completing a postdoctoral fellowship at the University of Connecticut Health Sciences Center; he received his Doctoral Degree in Biochemistry in 1971, from the University of Minnesota. Doctor Rick's research interests have been primarily focused on the processes involved in the assembly of cell-surface structures in bacteria. His laboratory works to define the genes and enzymes involved in the assembly of the enterobacterial common antigen of gram-negative enteric bacteria. He and the members of his laboratory have made great progress in defining the function of this unique polymer. Funded steadily since 1984, by grants from the National Institutes of Health, Doctor Rick has received intramural support from USU as well. Graduate students and postdoctoral fellows who worked in his laboratory have received training in the application of biochemical and molecular biological approaches to research. The School of Medicine community recognizes Doctor Rick as a distinguished scientist and faculty leader at USU; one who is well respected within the SOM and who will continue to be a strong contributor to faculty leadership.

USU Research Discovers a new Mechanism for Photoreception and Is Recognized by Science as one of the Top Ten Scientific Breakthroughs of 2002. Two thousand United States troops were sent from a base in North Carolina to the Sinai Desert, fulfilling their rapid deployment force mission to deploy anywhere in the world in 18 hours. While the soldiers were ready fighting forces when they left North Carolina, because of the effects of jet lag, their performance would have been degraded if they had had to engage in combat immediately upon arrival in the Desert. A discovery by scientists in the USU SOM Department of Anatomy, Physiology and Genetics (APG) could eventually result in a treatment for jet lag and help to optimize performance by deployed service members. Researchers have been studying the eye for several hundred years. Santiago Ramon Cajal, a Spanish neuroanatomist, who is frequently referred to

as *the father of neuroanatomy*, was the first to anatomically characterize the cells of the retina. Cajal's work showed that the rods and cones were the only two types of photoreceptors in the retina, initiating sight by activating nerve cells that send signals to the brain. The rods are the cells responsible for vision at low light levels, while the cones are active at higher light levels. His work done around the turn of the 20th Century, showing that rods and cones were the only photoreceptors in the eye, was long considered the standard until USU faculty member, **Ignacio Provencio, Ph.D., Assistant Professor, USU SOM Department of APG**, and colleagues from the University of Virginia found that some mammals lacking rods and cones could still reset their internal clocks to light. They demonstrated that mice without rods and cones still adjusted their biological rhythms in response to light. **Doctor Mark D. Rollag, Ph.D., Professor and Vice Chair, USU SOM Department of APG**, recruited Doctor Provencio to USU for a post-doctoral fellowship, and the two began their collaboration on research to identify a novel photopigment that could explain the mouse findings. A search for another photoreceptor was launched. The two investigators searched for the protein in frogs, specifically in the frog skin cell because it was easy to study in their laboratory. Their work showed that frog skin cells responded to light using opsin photopigment, as used by visual photoreceptors. A closer look into the frog eye revealed the phantom photoreceptor, which they named *melanopsin* for its location within the skin pigment cell. Doctor Rollag checked for melanopsin in chickens and Doctor Provencio found it in mice. Using that data, they looked for the protein in humans. The photoreceptor was found in the retina, but not in the rods and cones. The expression in the eye of the mouse looked exactly like the ganglion cells that projected to the biological clock, suggesting it could play a role in regulating the body clock. Using a marker for melanopsin cells in the retina, they identified a *photoreceptive net*, a new light-detecting apparatus in the retina. Based on their work, other scientific laboratories have extended their findings and have shown that melanopsin-contained ganglion cells are photoreceptors that are completely different than vision cells, but are still found in the eye. Doctors Rollag and Provencio found that melanopsin does play a role in resetting the body's clock, and in February of 2002, scientists and colleagues from Brown University proved their prediction that these melanopsin-containing cells are indeed directly sensitive to light. According to a report on the subject featured in the *Harvard Gazette*, light is a mixture of different frequencies or colors. By determining the frequency needed to reset the internal clock after it has been *knocked out of synch* by travel across time zones, scientists could develop a cure for jet lag. From the perspective of the Armed Forces, not having to acclimate or adjust the clock could ultimately save lives.

USU Researchers Target Malaria at Home and Abroad. Within the last year, an estimated two to three million deaths world-wide were caused by malaria. Combating this global threat is important to the military since fighting forces are often deployed into areas where malaria is endemic. Researchers at USU, led by **Donald R. Roberts, Ph.D., Professor of Tropical Public Health, USU SOM Department of Preventive Medicine and Biometrics**, are helping nations predict high-risk locations for malaria occurrence through satellite imaging and the use of geographic information system (GIS) technology. The technology is used to predict malaria mosquito population levels and disease transmission risks within precise areas and time frames. The National Aeronautics and Space Administration (NASA) is the primary sponsor of this research. Remote sensing and GIS technologies have the potential for targeting and managing malaria vector control in Belize, a Central American country that experienced a resurgence of malaria in the

mid-1990's. Through stratification, the country has reduced malaria rates since 1995. However, in 2000, Belize had to replace DDT with more expensive and less effective insecticides. To make efforts more cost-effective, officials could increase the use of remote sensing and GIS technologies to more precisely target the application of control measures. Past research in Belize has shown that these technologies can be used to identify favorable mosquito habitats through characterization of vegetation, bodies of water, and other environmental factors. This information, along with specific locations of human habitations, can help Belize's Ministry of Health pinpoint houses and high risk areas to reduce malaria control operational costs and the amounts of chemicals needed for effective levels of control. Once a functional GIS is developed for the whole country, it can also be used in other public health programs such as immunizations and dengue control. In September of 2002, two confirmed cases of malaria were discovered in Northern Virginia. In response, Doctor Roberts and his team, under existing memoranda of understanding, helped local and state health authorities trap and test mosquitoes that might be harboring malaria. They collected and verified the presence of malaria-positive pools of mosquitoes from Selden Island. The island is part of Montgomery County, Maryland, but is located on the Virginia side of the Potomac River. The USU team, led by Doctor Roberts, continues to provide technical and consultative expertise to authorities on this issue.

USU Faculty Member Selected as Finalist for Humanism in Medicine Award. **Lieutenant Colonel Francis G. O'Connor, MC, USA, Assistant Professor, USU SOM Department of Family Medicine, Director, Primary Care Sports Medicine,** was selected during 2002 as a finalist for the 2001 Humanism in Medicine Award, an annual award sponsored by the Association of American Medical Colleges (AAMC) through the support of the Pfizer Medical Humanities Initiative. Doctor O'Connor was one of 56 honorees from across the Nation who were selected by the AAMC Organization of Student Representatives. The selection is based on five characteristics of humanism in medical education: positive mentoring skills; community service; compassion/sensitivity; collaboration; and, observance of professional ethics. *“Medical Students learn by exposure to role model physicians who are not only scientifically qualified, but who also exemplify compassion, understanding and partnership,”* said Mike Magee, M.D., Senior Medical Advisor for Pfizer, Incorporated, and Director of the Pfizer Medical Humanities Initiative. *“Doctor O'Connor is such a physician and the students of the USU School of Medicine, through this award, have expressed their appreciation to him as both a physician and as an outstanding human being.”*

New USU Clinic to Study Post-Polio Syndrome. A new USU clinic is being used to research a chronic condition with symptoms that can be confused with aging. The Post-Polio Syndrome Clinic opened its doors on September 6, 2002, with an open house and a ribbon-cutting ceremony for the public. People with Post-Polio Syndrome (PPS), a chronic condition, can experience increasing disabilities related to

fatigue, muscle weakness, joint pain, and sleep disturbances. **Colonel Bahman Jabbari, M.D., Ph.D., USA, is the Director and Principal Investigator of the Post-Polio Syndrome Program; he also serves as Professor and Chair for the USU SOM Department of Neurology.** It is estimated that there are about 1.6 million polio survivors in the United States and Post-Polio Syndrome affects roughly one in five of these polio survivors. The clinic, located in USU Building 53 on the National Naval Medical Center compound, is part of the Clinical Neuroscience Laboratory, which also includes the Spinal Cord Injury Program Clinic. The staff of both clinics will use the laboratory to conduct future research project designs, program administration, patient evaluation/physicals, collections of specimen samples, data analysis, and management and sleep studies. Under the leadership of Colonel Jabbari, the clinic staffs support a multi-center study, which will aim to find the cause of Post-Polio Syndrome (PPS) and study treatment options for the affected patients. In Fiscal Year 2001, Congress provided funds to support research on the cause and treatment of PPS. Members of the Uniformed Services and civilians can participate in the PPS Program, which includes collaborators from USU, the National Naval Medical Center, the Walter Reed Army Medical Center, the National Institutes of Health, the National Rehabilitation Hospital, and the Conemaugh Health System located in Johnstown, Pennsylvania.

USU Faculty Member Elected to the Board of Directors of the American College of Emergency Physicians. Lieutenant Colonel Linda Lawrence, MC, USAF, FACEP, SOM Commandant, Associate Professor, USU SOM Department of Military and Emergency Medicine, was elected to the Board of Directors of the American College of Emergency Physicians (ACEP), the Nation's largest emergency physician association. Lieutenant Colonel Lawrence will serve a three-year term. The Council is composed of representatives from the organization's 53 chapters and 22 sections of membership and the Emergency Medicine Residents Association. The Board of Directors has 12 elected directors plus the president and immediate past-president and is the ACEP policy-making body that is responsible for the organization's management and control. ACEP, a national emergency medicine medical specialty society with nearly 23,000 members, is committed to improving the quality of emergency care through continuing education, research and public education. Lieutenant Colonel Lawrence was inducted as a Fellow of ACEP in 1995, and has held several leadership positions with the organization, including President of the Government Services Chapter from 1997 through 1998. Doctor Lawrence has more than 12 years of experience in emergency medicine, including four years spent at USU where she developed, and served as faculty for, the Introductory Emergency Medicine Didactic Course.

Appendix C provides selected examples of billeted and off-campus members of USU Departments and Programs and Department Activities receiving special recognition during 2002.

RESEARCH CENTERS AND PROGRAMS.

We will optimize our role in military and federal medical education and research.

We will effectively communicate the right information to the right people at the right time.

- Goals 5 and 7 of the USU Strategic Plan, 2002.

Research is Directed Toward Military Requirements. As discussed in the *Strategic Planning* and *Research Administration* sections of Part I of this annual report, the majority of the research programs and projects currently taking place at USU are focused on meeting the needs of the Uniformed Services. Research protocols throughout the SOM study diseases of high military relevance for troop deployment and sustainment. During 2002, the USU intramural program consisted of 72 militarily relevant protocols; extramurally funded research at USU, in 2002, included 173 projects supported by Federal agencies such as the National Institutes of Health (NIH), the National Science Foundation (NSF), the Department of Energy (DOE), the United States Army Medical Research and Materiel Command (MRMC), and the Office of Naval Research (ONR). These 245 protocols explored a wide span of scientific areas, including basic biomedical questions central to the mission of the Military Health System such as: 1) the mechanisms, transmission and control of a wide range of infectious diseases; 2) a variety of crucial topics in combat casualty care, operational medicine, and health education and promotion; 3) women's health issues in the DoD; and, 4) the development of new methods for the diagnosis and treatment of medical problems faced by the United States military and their dependents. Research contributed by SOM faculty relating to combat casualty care continues to provide rapid diagnostic methods and treatments that ensure military readiness.

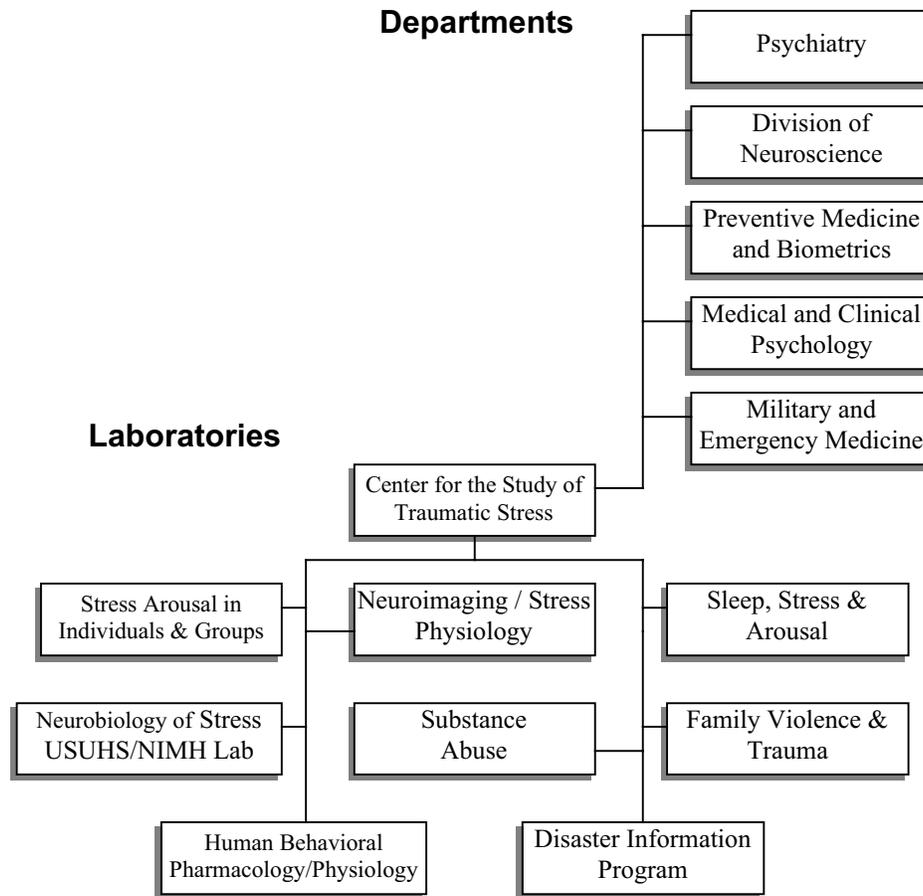
The USU researchers support the military mission by advancing the understanding of both the transmission and the internal mechanisms of a spectrum of pernicious and/or common diseases that may be faced by warfighters. *For example, technological advances by USU researchers have made it possible to predict mosquito population levels and transmission risks for a range of mosquito-borne diseases such as malaria, even within precise areas and time frames.* By using satellite imaging and remote sensing devices, USU researchers assist in predicting high-risk locations for the occurrence of malaria and similar diseases. These predictions focus disease-control operations and conserve scarce finances as well as human resources.

The following SOM Centers, Activities, and individual researchers are provided as selected examples of the research and consultative services taking place throughout the School of Medicine.

SELECTED PROFILES OF SOM CENTERS AND PROGRAMS

(See Appendix C for Additional Examples of Individual Achievements and Recognition)

USU School of Medicine Department of Psychiatry and the Center for the Study of Traumatic Stress.



Establishment. The terrorist attacks at the World Trade Center and at the Pentagon on September 11, 2001; hostage events; the poison gas attack on the Tokyo subway; the bombings at Oklahoma City, Africa, and the USS Cole; and, disasters such as Japan's Kobe Earthquake, which left 6,000 dead, 30,000 injured, and 300,000 homeless; as well as, more common *traumatic events* such as motor vehicle accidents, hurricanes, tornadoes, and physical assaults are all *substantial health risks to those who serve our Nation in the Uniformed Services* and to the general population of the United States. As the Academic Health Sciences Center for the Uniformed Services, USU is both nationally and internationally recognized for its consultative services to government and private organizations in times of disasters and critical incidents. The University is well situated to assist in meeting the needs of the Military Health System and of the Nation in the area of *traumatic stress*.

The USU Center for the Study of Traumatic Stress (CSTS) was established in 1987, as a center of excellence for responding to DoD's long-term concerns over the substantial health risks resulting from the traumatic impact of: 1) the possibility, or actual use, of weapons of mass destruction (WMD) during combat, acts of terrorism or hostage events; 2) combat, peacemaking, peacekeeping, and operations other than war; 3) natural disasters such as hurricanes, tornadoes, or floods; and, 4) more common stress producing events such as physical assaults and motor vehicle, shipboard, or airplane accidents. At present, investigators from the four USU SOM Departments of Psychiatry, Preventive Medicine and Biometrics, Military and Emergency Medicine, and Medical and Clinical Psychology, and the SOM Division of Neuroscience are collaborating on extensive studies of traumatic stress. The CSTS scientists are involved in a wide range of projects including responses to natural, man-made, and environmental disasters; the studies examine community responses to loss of life and property, community displacement, and organizational leadership. In addition, the CSTS research projects involve the examination of the physiologic change after trauma and the neurobiology of stress.

Terrorist attacks require our health care system to prepare for the unspeakable. The primary goal of terrorism is to erode the security of a nation, to disrupt the continuity of society, and to destroy the nation's social capital - its morale, cohesion, and values.

- **Robert J. Ursano, M.D., Chair, Department of Psychiatry, Director, Center for the Study of Traumatic Stress, USUHS, The New England Journal of Medicine, *Post-Traumatic Stress Disorder*, Volume 346, January 10, 2002, pages 130-132.**

Mission. Today, the Center for the Study of Traumatic Stress (CSTS) serves as a cutting-edge scientific endeavor. The CSTS continues to increase the military's medical knowledge (epidemiology, psychological, biologic, origins, and treatment) of the consequences of bioterrorism, trauma, and disaster and to apply that knowledge in addressing the real world problems and requirements of homeland defense, the response to terrorism and disaster, and humanitarian assistance. **Robert J. Ursano, M.D., Professor and Chair, USU SOM Department of Psychiatry, serves as the Director of the CSTS.**

Core Military Competency. The location of the CSTS within the multi-Service environment of USU, with its emphasis on education and development, studies, research, and on-going clinical and operational practice is critical to the development and sustainment of CSTS's ability to provide its core competency - *the capability to ensure the continued provision of critically required military-unique, medical expertise and consultative support in response to the impact of traumatic stress during and following activities related to crisis management, disaster response, and homeland defense.* The successful assessment and management of the behavioral, psychological, and social consequences of WMD-related and other national security contingencies is essential to DoD during the organization of effective responses to such events. Failure to attend to the consequences of WMD may lead to panic or demoralization and could undermine the confidence of the Armed Forces and American citizens in their government and its institutions. Only DoD has a self-renewing source of physicians and other medical personnel with interest and experience in these areas. USU, through its students in the School of Medicine and the Graduate Education Programs, and its career-focused faculty and staff, plays a vital role for the DoD in the

renewal process of militarily-focused and experienced health care providers in the study of traumatic stress. The Center's unique military medical capability to assess and manage the traumatic impact of WMD and other disaster-related contingencies provides direct support to Homeland Security and Defense.

Response/Support Subsequent to September 11, 2001. Within hours of the terrorist attacks in New York and at the Pentagon, CSTS staff provided: 1) immediate, on-going consultation to the hospitals, medical care planners, and elected leaders of New York City, the State of New York's Response Management Team, the Pentagon's Response Planning Team, and Arlington Hospital (42 casualties were received from the Pentagon) on staff stress/interventions; 2) continuous manning for the Stress Support Office at the White House/Executive Office Building; 3) on-going provision of resources and information packets for the USNS COMFORT deployment teams for stress related to body handling and concerns over families and terrorist activities; 4) a Disaster Care Resources Site on the USU Trauma Center Web Page; 5) OSD-coordinated and immediate responses to requests for consultation and expertise from Newsweek, ABC News, The Washington Post, and, The New York Times; 6) information packets to the Body Recovery Teams in both New York and Washington, D.C.; and, 7) membership on the Secretary of Defense's 12-member Task Force, "RED NUFF." During 2001, the Center also published *Military and Disaster Psychiatry* in the International Encyclopedia of the Social & Behavioral Sciences; this publication provides an overview of military and disaster psychiatry and examines the consequences of disasters and wars for communities and the evolution of medical responses to traumatic experiences.

The Center continued its ongoing support for the Nation from September 11th throughout 2002. Under the leadership of Doctor Ursano, the CSTS was highly sought out for its consultation, education, and research capabilities. Doctor Ursano was invited to a number of prestigious conferences relating to terrorism; in July of 2002, he was a participant in the NATO-Russia Advanced Scientific Workshop on Planning for Bioterrorism. And, he consulted with the World Health Organization on issues related to bioterrorism and mental health. In addition, Doctor Ursano was invited to write an editorial, *Post-Traumatic Stress Disorder*, which was published in the New England Journal of Medicine, Volume 346, January 10, 2002, pages 130-132. Also during 2002, Doctor Ursano was one of three speakers at the *Annual Carter Center Symposium on Mental Health Policy and September 11th*, along with Doctor Julie Gerberding, Director, Centers for Disease Control, and Doctor Neil Cohen of the Commission of Health for New York City.

During 2002, the CSTS collaborated on a publication for World Psychiatry, a widely circulated international Journal, entitled *Mental Health Intervention and High-Risk Groups in Disasters*. In addition, during the past year, the Center completed the only two empirical studies of Family Violence and the Army using an Army database for one study and a study of troops from Fort Hood (to include their spouses) who were deployed to Bosnia in the other. Currently, the CSTS is initiating studies on the effects of the traumatic stress resulting from the October 2002 Sniper Terrorism in the Washington, D.C. area on both the Military Health System and the civilian emergency responder communities. During 2002, the CSTS was the major planner in the recent DoD/ National Institutes of Health consensus meeting on early interventions following incidents of mass violence to prepare state and local leaders for the stress resulting from bioterrorism.

Doctor Ursano and his colleagues in the CSTS and the Department of Psychiatry published numerous articles during 2002, some examples include: 1) *Mental Health Intervention and High-Risk Groups in Disasters*, World Psychiatry, 1(3), pages 157-158, 2002; 2) *Psychological and Behavioral Impacts of Bioterrorism*, PTSD Research Quarterly, 13, page 107, Fall 2002; 3) *Post-Traumatic Stress Disorder*, New England Journal of Medicine,

346(2), pages 130-131, 2002; 4) *Regional Specificity of Brain Glucocorticoid Receptor mRNA Alterations in Subjects with Schizophrenia and Mood Disorders*, *Molecular Psychiatry*, 7, pages 985-995, 2002; and, 5) *Decreased Calcium-Dependent Constitutive Nitric Oxide Synthase (cNOS) Activity in the Prefrontal Cortex of Patients with Schizophrenia and Depression*, *Schizophrenia Res.*, 58, pages 21-30, 2002. The CSTS also had two books in press, in late 2002, at the Cambridge University Press - *Terrorism and Disaster: Individual and Community Responses to Extraordinary Events* and *Planning for Bioterrorism: Individuals, Communities and Nations*.

The CSTS welcomed **Rear Admiral Brian W. Flynn, United States Public Health Service (Retired), as an Associate Director** during 2002. Doctor Flynn is an international expert on disaster mental health and has presented at international conferences and provided consultation to state, national, and international organizations. During the past year, he traveled to Geneva to develop guidance on disaster and emergency planning; he also consulted with the United States Agency for International Development to design and implement a mental health program in post-war Afghanistan. In addition, Doctor Flynn assisted the Washington, D.C. Department of Mental Health in the development of an all-hazards disaster plan and follow-up on anthrax incidents. On May 7, 2003, he presented *Promoting Psychosocial Resilience in the Face of Terrorism* to members of the United States House of Representatives and their staffs.

Colonel Ann E. Norwood, MC, USA, USU SOM Class of 1981, Associate Professor and Associate Chair, USU SOM Department of Psychiatry, continued to serve as the Chair of the American Psychiatric Association's Committee on Psychiatric Dimensions of Disasters during 2002. During the past year, Doctor Norwood provided numerous presentations on bioterrorism to a number of organizations to include the Federal Emergency Management Agency (FEMA), the Environmental Protection Agency (EPA), and the Chemical Stockpile Emergency Preparedness Program (CSEPP). **Colonel Molly J. Hall, USAF, MC, Associate Professor, USU SOM Department of Psychiatry**, presented on the psychological and behavioral responses to weapons of mass destruction at the United States Air Force School of Aerospace Medicine and the District of Columbia Emergency Management Authority.

During the past year, the CSTS, with sponsorship from the Center for Mental Health Services/Substance Abuse and Mental Health Services Administration, joined with Walter Bartmen, founder and Director of the Yellow Barn Galley in Glen Echo, Maryland, to develop an innovative program to assist state and local community leaders in addressing the psychological impact of bioterrorism on the public. A group of artistically talented 11th and 12th grade students from Montgomery County, Maryland, participated in the project entitled, *Emerging Hope in the Face of Bioterrorism*. The project sponsored gifted teenage artists in a painting project to develop art for public service announcements after a bioterrorist attack. The art provides visual components to foster a sense of security and control and hope for the future following a bioterrorist attack. In addition to the art project, a series of videotapes and CDs were developed with input from experts who participated in the disaster response to September 11th and the anthrax attacks. These educational materials provide practical guidance to state and local officials on the psychological and behavioral consequences of bioterrorism. Admiral John Eisold, the United States Capital Physician; Doctor Neal Cohen, Commissioner of Health for New York City on September 11th; Ms. Mary Walsh, the National Security Producer for *CBS Evening News with Dan Rather*; and, other distinguished experts summarized the *lessons learned* since September 11th. The distribution of the CDs has been widely acknowledged by the leadership of individual States, the Supreme Court of the United States, and the Congress of the United States.

National and International Recognition of the Center's Leadership. **Robert J. Ursano, M.D., Professor and Chair, USU SOM Department of Psychiatry**, is internationally recognized as an expert in traumatic stress. In November of 2000, Doctor Ursano received the Lifetime Achievement Award, the highest award given by the International Society for the Study of Traumatic Stress. This award is given for outstanding and fundamental contributions to the understanding of traumatic stress; the award citation made particular note of Doctor Ursano's national and international contributions. Following September 11th, Doctor Ursano was widely quoted in the media including The New York Times, The Washington Post, and The Wall Street Journal; he also appeared on ABC News, NBC News, and the National Public Radio to discuss the psychological and behavioral effects of the September 11th terrorist attacks on the Nation. In addition, he was an invited participant at the DoD Terrorism Task Force, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) Panel on Planning for Bioterrorism, and the World Psychiatric Association Symposium on Disaster and Terrorism. **Doctor Ursano; Colonel Ann Norwood, MC, USA, USU SOM Class of 1981, Associate Professor and Associate Chair, USU SOM Department of Psychiatry; Carol S. Fullerton, Ph.D., Research Associate Professor, USU SOM Department of Psychiatry; and, Captain Thomas A. Grieger, MC, USN, USU SOM Class of 1987, Associate Professor, USU SOM Department of Psychiatry**, participated as subject matter experts in an International Consensus Conference on Acute Interventions following Mass Violence and Trauma. In October of 2001, Doctor Ursano and Colonel Ann Norwood participated in a panel discussion on *The Commitment and Role of Psychiatrists in Disasters - Lessons from the September 11th Disasters*, organized by the International Congress of the World Psychiatric Association. And, as mentioned earlier, in July of 2002, Doctor Ursano was a participant in the NATO-Russia Advanced Scientific Workshop on Planning for Bioterrorism; he also consulted extensively with the World Health Organization on issues related to bioterrorism and mental health. Also during 2002, Doctor Ursano served as a member of the Institute of Medicine, National Academy of Sciences Committee on Responding to the Psychological Consequences of Terrorism.

Areas of Study. Twelve major projects are currently funded with over six million dollars from the following sources: the Department of the Army; the National Institute of Mental Health; the National Alliance for Research on Schizophrenia and Depression; the National Alliance for the Mentally Ill Research Institute; the National Institute on Drug Abuse; the Substance Abuse and Mental Health Services Administration of the Department of Health and Human Services; the Stanley Foundation; and, the United States Marine Corps. *Ongoing studies include the following areas:* psychological and behavioral responses to weapons of mass destruction; combat stress; the prevention of stress-related disease; shipboard fires and emergencies; relocation stress; prisoners of war; leadership of those suffering from grief; medical personnel in disasters; traumatic stress and the immune function; community responses to disaster; identification of high risk populations; chronic stress; medical treatment following trauma; biomedical responses to stress; family violence; and, others. *Recently funded studies include:* combat stress in Bosnian-deployed troops; stress among emergency workers after an air disaster; psychological stress in the United States military deployed to Desert Storm/Shield; family violence and trauma; stress and women's health; combat, deployment, contingency operations, and trauma; basic neurobiology of genetic and second messenger stress responses; stress and arousal symptoms in individuals and groups using the Persian Gulf War symptoms as a paradigm; disaster psychiatry education; natural disasters and health outcome: adult and adolescent responses to Hurricane Andrew; genetic risk for substance abuse and cognitive processing; and, animal models for the study of the neurobiology of trauma responses and depression.

The CSTS Neuroscience Program grew significantly during 2002. Funding was received from DoD to begin laboratory renovations and to obtain stimulus presentation equipment for functional magnetic resonance imaging (fMRI). **Elizabeth Osuch, M.D. Assistant Professor, USU SOM Department of Psychiatry**, received

an R01 Grant from the National Institute of Mental Health to study *Functional Neuroimaging in Acute Stress Disorder and PTSD*. She also presented an invited lecture entitled, *Identifying and Accounting for Complexity in PTSD Functional Imaging*, at the Conference of the International Society for Traumatic Stress Studies in Baltimore, Maryland.

The impact of terrorism on individuals and communities continued as a major focus of the CSTS research during 2002. **Captain Thomas A. Grieger, MC, USN, USU SOM Class of 1987, Associate Professor, USU SOM Department of Psychiatry**, initiated several research and health surveillance projects examining post-trauma disorders and perceptions of safety and threat related to terrorism experienced by survivors of the attacks at the Pentagon and during the recent rampage of the Washington, D.C. area sniper on both the uniformed and civilian communities. **Carol S. Fullerton, Ph.D., Research Associate Professor, USU SOM Department of Psychiatry**, designed a survey to examine the impact of the sniper attacks on the Washington, D.C. metropolitan area that was distributed over the Internet. During the several-week period of the Washington D.C. area sniper attacks, an Internet-based survey was also designed to examine the impact of those attacks on personnel at the National Naval Medical Center. Data collected from personnel working at the World Trade Center, the USNS Comfort Disaster Workers and Personnel, and the Marines exposed to the explosion at the Pentagon were examined to better understand risk and protective factors. Captain Grieger is also collaborating on a study of the psychological reactions of the crew of the research submarine, the USS Dolphin, following a major flooding accident. In addition, Captain Grieger served as the senior faculty in a Joint-Service Humanitarian Mission to provide mental health education and consultation to the Republic of South Africa Defense Forces. Doctor Grieger also spoke at several national meetings regarding *The Principles of the Psychiatric Response to Disaster and Terrorism* and *Navy Medicine's Response to the September 11th Attack at the Pentagon*.

Focus of the Nine CSTS Laboratories. The CSTS has nine research laboratories that concentrate on the following areas of study: 1) stress and arousal in individuals and groups; 2) neuroimaging/stress physiology; 3) sleep, stress and arousal; 4) social function in high stress environments; 5) neurobiology of stress; 6) family violence and trauma; 7) human behavioral pharmacology/physiology; 8) substance abuse; and, 9) disaster information.

Scope of Research/Consultative Efforts. The Center's staff serve as consultants to a large number of Federal and non-Federal institutions involved with the understanding of responses to traumatic events and in the development of health policies. The CSTS collaborative efforts in education and clinical research respond to the following entities: **Federal Consultations** - the United States Army, Navy, Air Force, and the Marine Corps of the Department of Defense; the Department of Veterans Affairs; the Department of State; the Agency for International Development; the National Aeronautics and Space Administration; the National Institute of Mental Health; the National Transportation Safety Board; and, the Peace Corps; **Private Sector Consultations** - The American Medical Association; the American Psychiatric Association; the American Red Cross; the American Psychological Association; the Montgomery County (Maryland) School Systems and Police Departments; the Maryland Office of Motor Vehicles; the Oklahoma State Department of Health; and, the Los Angeles earthquake areas; **International Consultations** - the World Health Organization (consultation to Yugoslavia); the Armenian Ministry of Health; the Singapore Armed Forces; the Disaster Stress Center of the University of Oslo, Norway; the University of Beirut, Lebanon; and, the Traumatic Stress Center of the Hadassah Medical Center, Jerusalem, Israel. Scientists from the USU CSTS and their international collaborators from Norway, Israel, and Russia are performing studies at USU to better understand the individual, community, national, and international responses to traumatic events.

Fellowship Programs. The CSTS sponsors two trauma and disaster-related fellowship programs: the Visiting Science Fellowship Program and the Military Psychiatry Fellowship Program. Graduates of these programs serve as catalysts for research, educational, and clinical programs throughout the world. During 1998, the Center sponsored a visiting scientist from the Japanese National Defense Medical College. Since October of 1998, the CSTS has hosted a total of eight scientists from numerous nations, to include Japan, Singapore, Korea, and Germany.

Consistent with the DoD requirement to provide behavioral health expertise for mass casualty responses, population-oriented behavioral health programs and behavioral health epidemiology, the Department of Psychiatry and the CSTS, developed a new two-year Disaster/Preventive Psychiatry Fellowship sponsored by the National Capital Consortium and approved by the United States Army. The program will matriculate its first Fellow in the Summer of 2003. In addition to applying through the established Graduate Medical Education route, candidates must also apply to the USU SOM Graduate Education Programs and be accepted by the USU Master of Public Health Program for their first year. The second year will be spent with the Department of Psychiatry's CSTS and includes didactic experience, research, and rotations at other institutions.

Educational Activities. Another effort of the CSTS is its sponsorship of trauma and disaster-related programs. During 2001, the Center conducted a conference, *Planning for Biological Events: Responses to Terrorism & Infectious Disease Outbreaks*. The Center for the Study of Traumatic Stress, the USU SOM Department of Psychiatry, and the Center for Mental Health Services, Substance Abuse and Mental Health Services Administration, Department of Health and Human Services, sponsored a three-day conference. Attendees included internationally known scientists, public health and mental health leaders from the state and local levels, and representatives from the state executive branches. The conference was organized to: examine how communities perceive their needs for behavioral and mental health response preparedness in anticipation of bioterrorism and infectious disease outbreaks in the wake of training provided by DoD and the Department of Justice; develop recommendations for behaviorally and psychologically informed interventions to maintain and restore community function; provide recommendations on health communication and risk appraisal to state and local community leaders and others in order to respond more effectively to the mental health consequences of terrorist attacks; and, develop recommendations for education, training, and resource requirements to assist state and local officials to prepare for the mental health aspects of infectious disease outbreaks. The conference included four major presentations: 1) Learning from the Past: The 1918 Influenza Pandemic; 2) Biological Agents of Terror and Community Response; 3) State and Local Response Plans; and, 4) the New York City Experience. The conference extensively discussed how biological agents are the *atomic concern* for the New Millennium. The anthrax attacks demonstrated the ability of agents such as bacteria, viruses, and prions to create substantial disruptions. *Future management of bioterrorism requires a multidisciplinary approach to understanding the effects of these agents on nations, communities, families, and individuals.*

In September of 2002, the Deployment Health Clinical Center, directed by CSTS **Colonel Charles C. Engel, Jr., MC, USA, Associate Professor, USU SOM Department of Psychiatry**, sponsored, *Risk Communication & Terrorism: New Clinical Approaches*, the First Annual Conference on Post-Deployment Care. During 2002, Doctor Engel served on two national committees, a National Institute of Health Study Section, and the Department of Veterans Affairs National External Mental Illness Research & Education Clinical Center (MIRECC) Advisory Board; he also co-authored 19 peer-reviewed articles and two book chapters.

Preservation of Lessons Learned. The health implications of traumatic stress are a focused interest immediately following each trauma or disaster, but the data tends to be lost from institutional memory because of the lack of an organized center for the maintenance and development of the resulting information. The USU CSTS has served the Military Health System by capturing, organizing, and maintaining relevant information following disasters, terrorist events, and wars. Currently, the Center's basic computer data base (accessible to the Uniformed Services) provides over 15,000 items on traumatic stress. It is this data base that enabled the CSTS to effectively respond, throughout 2002, to the traumatic stress resulting from the terrorist acts of war against our Nation. Additional information is available at <http://www.usuhs.mil/psy/disasterresources.html> or <http://www.usuhs.mil/psy/traumaticstress/newcenter.html>.

Accomplishments of the Center's Family Violence and Trauma Project. The Center's Family Violence and Trauma Project (FVTP) entered its seventh year in October of 2002. The Center's FVTP provides support to command including the Army Community and Family Support Center Headquarters and Staff; the Headquarters, Department of the Army Family Advocacy Committee; the Family Advocacy Research Subcommittee; Family Advocacy Program Managers; Chiefs of Social Work Services; and, Army Social Workers. The FVTP has provided immediate responses, briefings, papers, and staff studies to the Headquarters Department of the Army Family Advocacy Program Managers and the Family Advocacy Research Subcommittee reference issues involving the scientific and medical aspects of child and spouse abuse.

In addition, during 2002, the FVTP completed the only two empirical studies of Family Violence and the Army using an Army database for one study and a study of troops from Fort Hood (to include their spouses) who were deployed to Bosnia in the other. Also, an analysis was initiated on the Army's Transitional Compensation data base, which lists cases of soldiers who have been discharged from the Army where spouse or child abuse has been a part of the discharge. Joining Forces, a quarterly newsletter of the FVTP, brings important research to the field and enjoys strong popularity within the Army and the DoD. The FVTP has also continued to add to its scientific literature data base of family violence articles. This data base is used for scientific reference to improve the development of family violence research protocols and to further the research education of Army military and civilian research social workers. Many of these articles have been sent to investigators and program managers in the Army's Family Advocacy Program (FAP) and FAP-related programs such as the military police school for teaching police to respond to incidents of family violence.

The CSTS Is Positioned to Respond to Future Requirements of the Military Health System. The USU CSTS, with its acknowledged experts and collaborative network of national and international scientists, is positioned to continue in its response to the special needs of the Military Health System and the Nation as requirements are identified in areas such as: 1) adaptation, recovery, and resiliency; 2) posttraumatic and terrorism-related psychiatric illness; 3) neurobiology of stress; 4) medical illnesses developing as a consequence of traumatic stress; and, 5) the impact of traumatic stress on the health of individual family members, family units, and organizational and community functioning.

The USU School of Medicine Department of Preventive Medicine and Biometrics, Graduate Education in Preventive Medicine and Public Health, and the Centers for Preventive Medicine and Public Health.

Graduate Education in Preventive Medicine and Public Health.

The SOM Department of Preventive Medicine and Biometrics (PMB) offers programs of study leading to the graduate Degrees of Master of Public Health (MPH), Master of Tropical Medicine and Hygiene (MTM&H), Master of Science in Public Health (MSPH), Doctor of Public Health (DrPH), and Doctor of Philosophy (PhD) in Medical Zoology and Environmental Health Sciences. Between 1983 and April of 2003, PMB has graduated 436 individuals and granted 386 MPH, 4 MSPH, 25 MTM&H, 1 MS, 11 DrPH, and 9 PhD Degrees. During 2002, 36 Preventive Medicine and Biometrics students were awarded advanced degrees: 1 Doctor of Philosophy; 4 Doctors of Public Health; 29 Masters of Public Health; and, 2 Masters of Science in Public Health. The PMB Graduate Programs have undergone considerable growth over the past several years and have approximately 60 students currently enrolled in the Master and Doctoral Programs. With its stated mission to *produce knowledgeable and highly skilled public health professionals in support of the health and global mission of the Uniformed Services*, the PMB Department has sought to be responsive to the needs of its customers; and, this is reflected in the types of programs and training offered. During 2002, PMB continued its collaborative educational agreements with the Walter Reed Army Medical Center Preventive Medicine Residency Program and Internal Medicine Fellowship Program, the Army Program for Training in Health Services Administration, the United States Army and United States Public Health Service Laboratory Animal Medicine Program, the Navy Dental Research Institute Program in Dental Public Health, and the Indian Health Service Environmental Health Training Program. In addition, the PMB Department is affiliated with the United States Army and Navy Biomedical Research Laboratories located in: Bangkok, Thailand; Rio de Janeiro, Brazil; Nairobi, Kenya; Cairo, Egypt; Jakarta, Indonesia; and, Lima, Peru. The MTM&H Program includes a six-week overseas clinical experience in tropical medicine; graduate students find excellent opportunities at these overseas laboratories. A research program also exists under an agreement with the Ministry of Health in Belize. Doctoral students have found considerable opportunities to do research in these various locations.

The class composition, as of April 2003, for the Graduate Programs in Public Health consists of 48 master-level students (MPH, MTM&H, and MSPH); these programs are designed for students with at least three years of experience in a health-related field. Forty-four of these students are in the Uniformed Services and four are civilians. *The 48 master-level students include:* 19 physicians; 12 veterinarians; 3 dentists (including a member of the Canadian Forces); 2 nurses; 1 physical therapist; 1 dietitian; 1 statistician; 1 engineer; 4 environmental science and industrial hygiene officers; 3 Air Force Biomedical Science Corps (BSC) officers (in the health physics and international health specialist tracks); and, 1 health services administrator. First-year residents in General Preventive Medicine/Public Health and Occupational and Environmental Medicine take courses and meet all of the requirements for the MPH or MTM&H Degrees as part of their residency training. *The 12 doctoral-level students include:* 8 individuals (3 uniformed officers; 5 civilians) who are Doctor of Public Health candidates; and, 4 individuals (3 uniformed officers; 1 civilian) who are Doctor of Philosophy candidates.

The Graduate Education Programs offered by the PMB Department, as an integral part of the SOM and the SOM Office of Graduate Education, are included in the full accreditation granted by the Commission on

Higher Education of the Middle States Association of Colleges and Schools to the University. In addition, the PMB graduate programs are nationally accredited by the Council on Education for Public Health (CEPH). CEPH is the recognized accrediting body for graduate schools of public health and graduate programs in community health education and community health/preventive medicine. The CEPH report, following the June 1998 site visit by a team of external evaluators, noted that *the values of the institution and the philosophy of military medicine are an exceptionally good fit with the values and philosophy that underlie public health and preventive medicine. The program has strong ties to the military community, both locally and worldwide, and the instructional programs have particular relevance to the needs of the Uniformed Services to which the program graduates will return after their training. The curriculum is quantitatively-oriented and rigorous.* The PMB Graduate Programs in Public Health are fully accredited through 2005. The **Program Director, Colonel Gary D. Gackstetter, DVM, Ph.D, MPH, BSC, USAF, Assistant Professor, USU SOM Department of PMB**, can be contacted by e-mail at <ggackstetter@usuhs.mil> or at <www.usuhs.mil/pmb/pmb.html>.

Following the CEPH accreditation process in 1998, an *ad hoc* committee was established to articulate the mission, goals, and objectives of the PMB Graduate Programs. This document has since become part of a dynamic process of program review and evaluation for continuous quality improvement, including efforts to identify measurable program outcomes. In addition to the rigorous, quantitatively-focused curriculum (60 credit hours), *students are required to complete a 108-hour practicum experience*, as well as an independent project. Greater emphasis has been placed on basic research methodology, and students are encouraged to present their research results at scientific meetings and to submit manuscripts to peer-reviewed journals for publication. Each June, the Department sponsors an annual Public Health Colloquium to feature the four or five best independent projects. A growing number of student projects eventually culminate in publications in peer-reviewed journals.

In response to the CEPH requirement for a practicum or field experience as part of the MPH Program, a new departmental program office was established to direct graduate student activities related to the practicum experience and the required MPH independent project. During their 108-hour practicum experience, students have the opportunity to apply knowledge and skills learned in the classroom within various *real world* settings at public health agencies and other health-related organizations offering practical experiences as a planned, supervised, and evaluated educational activity. Examples of practicum sites include the following: Headquarters, United States Air Force Safety Center; the National Security Administration; the Pentagon, Defense Medical Oversight Committee; the Food and Drug Administration, Center for Veterinary Medicine; the State of Maryland, Department of Health and Mental Hygiene; the United States Consumer Product Safety Commission; the Office of the Assistant Secretary of Defense for Health Affairs, Clinical and Program Policy; and, the White House Commission on Complementary and Alternative Medicine Policy. **Tomoko (Tonie) I. Hooper, MD, MPH, Assistant Professor, USU SOM Department of PMB**, is the Director of Graduate Research and Practicum Programs; and, she also serves as the Deputy Director for the Department of PMB's Graduate Education Programs.

Outstanding Responsiveness to the Continuing Medical Education Requirements of the TriServices. A new PhD Program in *Environmental Health Sciences* was recently established in response to the identified needs of the Uniformed Services; it currently has two military students, both active duty Navy officers, enrolled in the program. In addition, the *Master of Science in Public Health (MSPH) Program* has graduated four degree candidates between 2000 and 2002, with one other individual expected to complete the program in June of 2003. The two-year MSPH Program is designed for the non-physician public health practitioner planning a

career in one of *four specialty areas of public health: environmental health; industrial hygiene; health physics; or, medical entomology*. Students have the opportunity to design and develop research protocols leading to a Master's Thesis. *Following the September 11, 2001, attack on the Pentagon, two MSPH students and one PhD student, as well as the PMB Department staff, assisted the United States Army and the Environmental Protection Agency (EPA) to set up a command unit for chemical detection at the site of the disaster.*

The Division of Aerospace Medicine has been providing course work in the area of applied Aviation Physiology for the past three years as a specialty track in the Master of Public Health Program offered by the USU SOM Department of PMB. This track consists of five courses: Aviation Operational Physiology I and II; Aviation Human Factors; Aviation Exercise Physiology; and, Special Topics in Aviation Physiology. This course of study prepares students for a career in the military as an *Aviation Physiologist*. Since its beginning in 1999, six students have completed the program and three additional students have audited the course. During 2003, the program will be expanded with the addition of a flight familiarization aspect.

Recognizing the importance of occupational musculoskeletal injuries among military personnel and in response to the Army's request for specialty training in occupational ergonomics within the MPH Program, a new area of concentration was established, *the Occupational Ergonomics Concentration in the Department of Preventive Medicine & Biometrics Master of Public Health Program*; the first student entered this program in July of 2002, and will graduate in June of 2003. The Occupational Ergonomics Program is the only established graduate-level injury prevention program in the Department of Defense. And, the *International Health Specialist Program* was added as an additional area of concentration within the MPH Program in response to a request from the Surgeon General of the Air Force. Four students entered the program in July of 2002, and will receive their MPH Degrees in June of 2003.

In response to the request of the Military Health System, *the TriService Advanced Military Tropical Medicine Course* has been offered at USU, beginning in 1996, through the Summer of 2002. The course resulted from a consolidation of the Walter Reed Army Institute of Research's Tropical Medicine Course and the Navy's Medicine in the Tropics Course. Under the auspices of the USUHS-SOM Department of Preventive Medicine and Biometrics, *Department of Defense personnel receive education and training in tropical infectious diseases as an integral part of their medical readiness training for foreign military operations*. The four-to-seven-week Military Tropical Medicine Course is held annually in July. During 2002, 75 military medical officer students were trained in operational military medicine, consisting of four weeks of lectures and laboratories in the advanced diagnosis and treatment of tropical diseases. Approximately 70 lecturers provided 106.5 hours of didactic instruction. The course included parasitology, bacteriology and virology laboratories; one medical entomology laboratory; and, one outbreak investigation laboratory taught by multiple PhD instructors. Military medical officer students have traveled on numerous field missions to overseas sites with PMB faculty members. They have been able to observe, examine, diagnose and treat patients with tropical diseases in their local settings. To date, approximately 375 students have completed the course.

The *Tropical Medicine and Travelers' Health Course* is offered as a 12-week course during the Spring Quarter of the MPH Program. It includes a comprehensive lecture, seminar, laboratory and case-based curriculum approved by the American Society of Tropical Medicine and Hygiene and leads to eligibility for the qualifying examination in Tropical Medicine and Travelers' Health. To date, 27 medical officers have completed the course, including 16 who have subsequently taken and passed the certification examination. The *Diagnostic Parasitology Course* is offered as a series of lectures and hands-on laboratory sessions for individuals wishing to study parasitic

infections in humans. Military and civilian medical technologists and physicians from all parts of the world have completed this course. Participants for the course have included: United States Embassy personnel from Asian and African countries sent by the United States Department of State; members of the Peace Corps; a medical doctor from the Japan Ground Self Defense Force; and, civilians from various foreign and domestic health-related organizations. Since 1988, over 263 individuals have taken the course; to include, the 27 individuals who took the course during 2002.

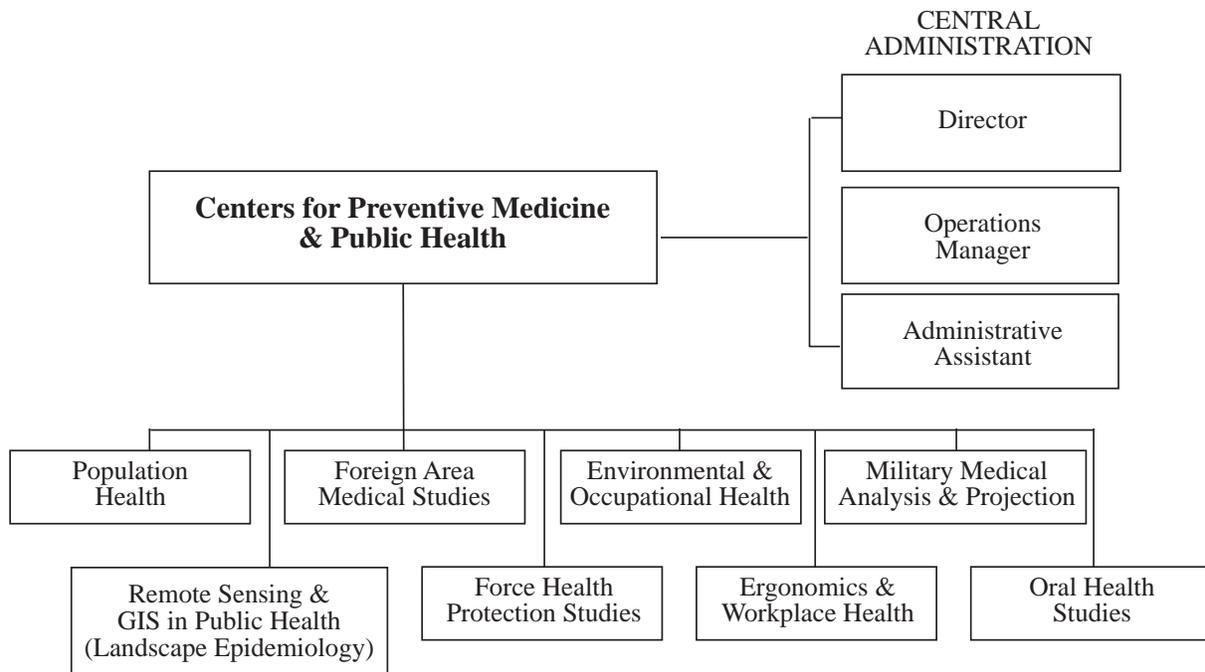
The ***Medical Executive Skills Training - Integrating Clinical Managerial Decisions to Improve Population Health Course*** is a five-day training course held five times each year. It was established in 1995, in response to the Congressional mandate requiring current and prospective DoD health care leaders to receive training in health care management and administration. The program integrates lectures, hands-on computer laboratory exercises, and web-based distributed learning approaches. Continuing Medical Education credit has been approved by the following: the Accreditation Council for Continuing Education; the American Nurses Credentialing Center's Commission on Accreditation; the American Academy of Family Physicians Commission on Continuing Medical Education; and, the American College of Healthcare Executives. To date, 29 sessions have been held in the TRICARE regions and approximately 850 senior officers have been trained for the MHS.

The ***Master of Comparative Medicine is an Interdisciplinary Graduate Program*** and offers a new degree, the Master of Comparative Medicine (MCM). The MCM Program falls within the scope of graduate programs defined as appropriate for the University, responds to a specified need of the Uniformed Services, and fosters a positive collaborative relationship with USU, the National Institutes of Health, the United States Public Health Service, and the Department of Army Medicine. *The program will continue to fulfill the obligation undertaken by USU in 1993, to build a graduate degree program in support of Laboratory Animal Medicine (LAM) residency training.* This Master Degree Program is the redesignation of graduate courses approved by the USU SOM Graduate Education Committee for the USU Master of Public Health Degree Program in the Department of Preventive Medicine and Biometrics. The Comparative Medicine faculty will consist largely of non-billeted LAM veterinarians and other USU faculty who qualify for secondary faculty appointments in the MCM Program under the terms of USU Instruction 1100, *The Appointment, Promotion, and Tenure of the Faculty*. Leadership for the program, pending adequate senior faculty in Comparative Medicine, will be provided by a committee of USU senior basic science faculty familiar with the issues of graduate education and the use of laboratory animals in medical schools. This committee, called the Academic Administrative Committee, will consist of at least three professorial faculty and will evaluate candidates for matriculation, approve graduate programs of study, counsel students in difficulty, and recommend students for the awarding of the degree on completion of an approved program of study. Until such time as the Comparative Medicine Program achieves mature status with a critical mass of senior faculty principally interested in the program, it will not have independent representation on SOM committees, but will report *ad hoc* as needed. Since the program is a redesignation of existing student programs and course work, no new space or faculty resources are required. While the primary motivation for establishing the Comparative Medicine Residency Program, of which this Master Degree is a part, is collaboration with other Federal health agencies, there are also benefits to USU and its graduate programs. While working with the students from this program, USU faculty and graduate students will share their interests and scientific work. And, the alumni of this program will return to animal facilities in the Department of Army Medicine, the United States Public Health Service, the National Institutes of Health, or elsewhere, where they will be in an ideal position to foster collaboration among interested research workers in similar areas.

Centers for Preventive Medicine and Public Health.

The Centers for Preventive Medicine and Public Health (CPM/PH) are an entity within the USU SOM Department of Preventive Medicine and Biometrics. The eight Centers, under the direction of **Kenneth E. Kinnamon, D.V.M., Ph.D., Professor, USU SOM Department of Preventive Medicine and Biometrics,** operate under terms of a Memorandum of Understanding with the Henry M. Jackson Foundation for the Advancement of Military Medicine. The Centers combine broad expertise in research, consultation, education, training, and clinical preventive medicine and public health; this expertise is used to develop data bases and analytic methodologies, prepare innovative curricula, and evaluate processes and outcomes in clinical practices. The following eight Centers provided consultative, research, and educational services to the TriServices during 2002:

- 1) The Center for Application of Remote Sensing and Geographic Information Systems (GIS) in Public Health (Landscape Epidemiology);
- 2) The Center for Environmental and Occupational Health;
- 3) The Center for Ergonomics and Workplace Health;
- 4) The Center for Force Health Protection Studies;
- 5) The Center for Foreign Area Medical Studies;
- 6) The Center for Military Medical Analysis and Projection;
- 7) The Center for Oral Health Studies; and,
- 8) The Center for Population Health.



The Center for Application of Remote Sensing and Geographic Information Systems in Public Health (Landscape Epidemiology).

Background. Remote sensing has an increasingly prominent role in the improvement of public health programs; therefore, a significant number of graduate students in public health are seeking formal training and experience in remote sensing technology. The Center's earlier National Aeronautics and Space Administration (NASA)-supported research equipment, along with additional equipment provided by a recent NASA grant for the purchase of hardware and software, have both been used to establish a Center in which remote sensing technology is applied to emerging and re-emerging infectious diseases and environmental health.

Mission. The Center provides faculty expertise and the software and hardware necessary for students and faculty to engage in basic landscape epidemiological research utilizing remote sensing (RS), geographic information systems (GIS), and other technologies to protect the environment and improve public health. The Center compiles satellite and earth-based data to identify relationships between environmental parameters and human health. This information is used to predict the temporal and spatial distribution of diseases, as well as the impact of environmental perturbations on health. **Donald R. Roberts, Ph.D., Professor, USU SOM Department of Preventive Medicine and Biometrics, served as the Director for the Center during 2002, specializing in remote sensing and geographic information systems.** Doctor Roberts is a member of: the American Society of Tropical Medicine and Hygiene; the Society of Vector Ecology; and, the American Mosquito Control Association. He is interested in developing new and innovative models for malaria control and in applied research for testing different approaches to controlling malaria. For many years, he has studied the behavioral responses of malaria vectors to insecticide residues and this research has culminated in a new conceptual model for actions of insecticides in malaria control programs; these efforts have resulted in numerous scientific publications and extensive press coverage. Doctor Roberts also serves as the Office of the Army Surgeon General representative (alternate) to the Armed Forces Pest Management Board. And, he serves as the DoD representative on the Department of the Interior's National Invasive Species Council Interagency Subcommittee on Early Detection and Rapid Response.

Educational Activities. The Center offers a four-hour credit course entitled, *Remote Sensing and GIS Methods in Public Health*, and non-credit training classes in remote sensing and GIS to students and faculty. Both credit and non-credit courses cover the basic elements of remote sensing and geographic information systems (GIS) with emphasis on the areas most relevant to public health (such as classification, raster GIS modeling, and integrating field maps with remotely sensed images). The credit course, first presented during the Winter Quarter of 1998-1999, has been offered in the Fall Quarters of 1999, 2000, 2001, and 2002, as part of the MPH curriculum and has been enthusiastically received by the students. The course covers remote sensing, image processing, GIS, and spatial analysis methods as applied to the field of public health. The goal of the course is to provide students with a combination of theoretical background, example applications in the published literature, and hands-on experience in using hardware and software to enable them to use the techniques discussed in class in a knowledgeable way in their research and future work in public health. The lectures cover types of remote sensing imagery, image processing, photointerpretation of various imagery types, application of remote sensing to public health, the overview and history of GIS, GIS data structures, entering data into a GIS, geographic analysis, cartographic presentation, and applications of GIS to public health. The laboratory provides students with hands-on experience in the public health uses of image processing and GIS software. The next presentation of the course is scheduled for the Fall Quarter of 2003.

The Center computers are being used to support research activities for several projects including malaria research in Belize and Thailand, as well as for a Bartonellosis project in Peru. The computers are utilized to create maps and analyze the spatial data of the project sites; these maps can be printed and used in the field.

Malaria Research in Belize. Since 1995, the Center has conducted research in Belize to apply remote sensing and geographic information systems to the National Malaria Control Program with funding provided by NASA in direct support of the Belize Ministry of Health. The Center has received a five-year grant from the National Institutes of Health (NIH) along with the University of California, Davis, to continue its work in Belize. Research under the NIH grant is focused on studying human-induced change, such as deforestation along streams and changes in marsh vegetation due to agricultural runoff, and the effect these changing environments have on the distribution of malaria in Belize. One DrPH student is currently using the historical malaria data collected during the earlier Belize research in her dissertation project. In addition, another PhD student in Medical Zoology is contributing to the mapping of deforestation along rivers under the Belize grant and will use this study as part of her dissertation. Thus, graduate research has been supported to study the spatial distribution of Bartonellosis in several local villages in Belize and the environmental variables that effect the distribution of malaria in Belize.

Malaria Research in Thailand. During 2001, work began on remote sensing and geographic information systems to define spatial relationships between mosquitoes, humans, and malaria incidence in Thailand. This study is a collaboration among investigators with the Division of Tropical Public Health in the USU SOM and Army researchers at the Armed Forces Research Institute of Medical Sciences (AFRIMS), at Bangkok, Thailand; it is funded by the United States Army Medical Research and Material Command. The principal investigator, Doctor Leon Roberts, presented the collaborative research at the Annual Meeting of the American Society of Tropical Medicine and Hygiene in November of 2002. During Fiscal Year 2004, this research project will be expanded to study the spatial relationships of scrub typhus in Thailand.

Bartonellosis Research in Peru. During 2002, work was continued on applications of remote sensing to study bartonellosis in Peru. Initiated during 1997, the work in Peru is a collaboration among investigators within the Division of Tropical Public Health in the USU SOM and the Navy researchers at the Navy Research Laboratory in Lima, Peru. During 2000, a three-year grant was received from the National Oceanographic and Atmospheric Administration (NOAA) to study climate variables and the incidence of bartonellosis. This work is currently being conducted with two climatologists at NASA's Goddard Space Flight Center.

The Center for Environmental and Occupational Health.

Mission. The Center for Environmental and Occupational Health promotes excellence in programs focusing on environmental and occupational health by providing research, consultation, education, and training support to government entities and educational institutions. Areas of interest pertaining to environmental and occupational health include: policy, education, and training; health risk and hazard assessment standards setting; resource management; regulatory compliance; pollution prevention; and, environmental restoration. **David J. Louis, M.D., M.S., Col, USAF, MC, Assistant Professor, USU SOM Department of Preventive Medicine and Biometrics, served as the Director of this PMB Center during 2002.**

Research Activities.

Pareto Analysis of Injuries of New York City 9/11 Emergency Responders. During 2002, a comprehensive analysis of injury and illness data of policemen, firefighters, emergency medical technicians and rescue construction workers in the aftermath of the World Trade Center Disaster of September 11, 2001, was undertaken by the Center with Doctor Louis serving as a co-investigator. Key hazard control issues were identified in the use (and misuse) of a wide variety of personal protective equipment. New areas for further investigation were also identified regarding group-specific injury rates. The work from this analysis was recently cited at the State-of-the-Art Conference of the American College of Occupational and Environmental Medicine held in Baltimore, Maryland, in October of 2002.

Indian Health Service Education and Training Support Program. At first, the principal output of this program was the administration of a one-year Environmental Health Post-Graduate Fellowship on behalf of the Indian Health Service of the United States Public Health Service. In July of 2001, two students from the Indian Health Service (IHS) began their studies at USU in the one-year Master in Public Health (MPH) Program; the two students received their MPH Degrees in June of 2002. Throughout the Fall of 2001, and the Spring of 2002, **Colonel Robert Lipnick, MS, USA, Division of Environmental and Occupational Health, PMB,** coordinated with the IHS in the development of a variety of rotations/courses that would compose a second year of Environmental Health Post-Graduate training. Due to that effort, the two initial students have successfully experienced a second year of study, which will conclude in 2003. The IHS is currently seeking nominations for two additional personnel to begin the above-described two-year program beginning in July of 2003. A Memorandum of Agreement between USU and IHS is being formalized for this program.

Enhancement Through Operational Research of the United States Army's Global Preventive Medicine Program. This project is a follow-on to an original grant initiated in July of 1995, which terminated on March 31, 2001. The original grant consisted of nine separate research initiatives: Health Risk Assessment; Health Promotion; Health Hazard Assessment; Occupational and Environmental Medicine; Environmental Compliance and Pollution Prevention; Medical Entomology; Radiation Protection; Preventive Medicine Readiness Planning; and, Preventive Medicine Planning and Integration. Five research tasks were identified: conduct a program assessment; develop alternative program change methodologies; develop measures of merit to evaluate alternative methodologies;

implement and evaluate the selected methodology; and, publish results. The total funding level was set at \$21.362 million. The research took place at the United States Army Center for Health Promotion and Preventive Medicine (CHPPM). During the five and one-half years of the original project, over 500 publications were produced, including technical reports and assessments, peer-reviewed and other publications, training session materials, studies, and professional meeting presentations. Because of the success of the original grant project, CHPPM reinitiated a follow-on project with USU and the Henry M. Jackson Foundation (HJF) that began on April 1, 2001, as a contract effort. Funding in the amount of \$4.2 million for the first year (April 2001 through March 2002) of the follow-on project was received. The project entitled, *Enhancement Through Operational Research of the United States Army's Global Preventive Medicine Program*, is divided into ten study areas: 1) Health Risk Assessment; 2) Health Promotion; 3) Health Hazard Assessment; 4) Epidemiology and Medical Surveillance; 5) Environmental Health and Compliance; 6) Medical Entomology; 7) Radiation Protection; 8) Ergonomics; 9) Clinical Preventive Medicine; and, 10) Informatics. A total of 58 personnel were employed through the HJF for this project. At the completion of the first year, the project was re-established as a new one-year contract effort on April 1, 2002, with four follow-on option years built in. Funding in the amount of \$3.2 million was received for the first year of the new contract (April 2002 through March 2003). As of September 30, 2002, 47 personnel, employed through the HJF, were working on the project.

The other research activities carried out by the Center include the following: 1) *the Development of Environmental Organic Contaminant Sampling and Analysis Methods*, which focused on three areas: field detection methods for military relevant compounds; the legislative mail task force; and, training for field chemical detection; 2) *the USU Laser Tissue Interaction Team*, which focused on three areas: the Health Effects of the Pulsed Energy Projectile; the Epidemiology of Laser Injuries in the United States Air Force and the DoD; and, the Triage and Treatment of Laser Eye Injury on the Modern Battlefield; 3) *Performance Characteristics of Toxic Chemical Exposure Biomarkers in Deployed DoD Personnel and the Application to Health Risk Assessment*, which involves analyzing blood and urine samples from 50 service members taken before, during, and after a military deployment to see if changes occur in metals, volatiles or other agents. A DrPH student has successfully defended this research proposal before the USU Institutional Review Board (IRB), the Armed Forces Institute of Pathology IRB, and the Center for Disease Control IRB; and, 4) *Detection of Chemical Warfare Agents in Drinking Water Using Solid Phase Microextraction Technology*, which involves working with the United States Army Center for Health Promotion and Preventive Medicine on the detection of chemical agents using solid phase microextraction.

The Center for Ergonomics and Workplace Health.

Mission. The Center for Ergonomics and Workplace Health focuses on an integrated approach to ergonomics and occupational health, targeting both the civilian and military workplace. Research in the Center is directed at understanding the interactive roles of medical, biomechanical, organizational, workplace and individual psychosocial factors in the etiology, prevention, and management of prevalent occupational health problems. Currently, the Center conducts research on the mechanisms and management of workplace musculoskeletal disorders and is also involved in education, public policy, and consultation. The Center is a joint effort between the USU SOM Departments of Preventive Medicine and Biometrics *and* Medical and Clinical Psychology. **Michael Feuerstein, Ph.D., Professor, USU SOM Department of Medical and Clinical Psychology, served as the Director of the Center during 2002.**

Predictors of Health Care and Limited Duty in United States Army Soldiers. During 2002, the Center continued its research on the mechanisms and the management of workplace musculoskeletal disorders. For example, a study of the Predictors of Health Care and Limited Duty in United States Army Soldiers was conducted to identify the differential contribution of a diverse set of risk factors for lost time in duty status among Army soldiers due to low back pain. A prospective study was conducted on the role of ergonomic and psychosocial stressors on physical exertion, back symptoms, health care utilization, and lost work time/limited duty status in active duty personnel working in jobs associated with increased disability for back-related issues. Results can subsequently lead to the development of empirically based interventions that directly address identified relationships and to the refinement of existing secondary prevention efforts for reducing the impact of low back pain on soldier readiness. The findings support the importance of early evaluation of ergonomic, workplace, and individual psychosocial variables that can affect the recovery process. The findings also suggest that effective interventions should be directed at reducing or eliminating ergonomic stressors, improving the work climate through supervisor training, as well as training directed toward employees to reduce or eliminate the sources of both job and life stressors. Such an approach should positively impact a range of outcome measures and reduce the burden of low back pain, on both the worker and the employer. Two manuscripts were generated from this research; the first paper was based on the cross-sectional analyses and identified risk factors for individuals who had low back pain but were still working. The second paper examined the association between problem solving orientation and physical and mental health outcomes in soldiers reporting a history of low back pain in the past year. This project was supported by funds from the United States Army Center for Health Promotion and Preventive Medicine (CHPPM).

Self-Report Index for Upper Extremity-Related Ergonomic Exposure. This Ergonomics Demonstration Project seeks to evaluate the effectiveness of an ergonomic intervention for high risk and non-high risk active-duty soldiers in reducing the occurrence and severity of self-reported musculoskeletal symptoms, perceived level of physical exertion, clinic utilization, lost work time, limited duty status, and self-reported exposure to ergonomic stressors. Ninety-two symptomatic office workers completed a web-based questionnaire measuring demographic variables, ergonomic exposures, pain, job stress, and functional limitations. Comparisons of internal consistency, construct validity, and discriminative and predictive abilities were made between the self-report index and an observational exposure assessment checklist. Results indicated that the self-report index had acceptable measurement properties. Furthermore, higher levels of self-reported ergonomic exposures were associated with

upper extremity pain, symptom severity, and functional limitations. In contrast, higher levels of observed exposure were only related to lower levels of general physical function. The self-report measure has potential for use in occupational health surveillance programs for office work environments and as an outcome measure of ergonomic exposure in intervention trials. These results also suggest the need for utilizing multiple methods when assessing ergonomic exposures. This project was funded by a grant from the Occupational Ergonomics Research Committee. Articles have been published in Military Medicine (2001), The American Journal of Industrial Medicine (2002), The Journal of Occupational and Environmental Medicine (2002), and the Annals of Behavioral Medicine (2002).

Predictors of Recovery in Occupational Low Back Pain in Primary Care. The Predictors of Recovery in Occupational Low Back Pain in Primary Care is an on-going investigation designed to develop a screening tool for predicting functional and health outcomes in a military primary care setting. Military personnel and civilians between the ages of 18 and 55 who present with a new onset of back pain (no back pain over the past year) and seeking medical care at the military primary care clinics at Fort Hood and Fort Bliss were invited to participate in the study. Study participants were given a baseline survey that assessed ergonomic exposure, function, general physical health, and general mental health in addition to demographic, individual psychosocial, job stress, work organization, and medical history information. Follow-up data regarding the presence of health care visits for low back pain and limited duty status will be collected for three months following the initial clinic visit using the Ambulatory Data System database. The study will also develop a screening tool to identify those individuals who may be at an increased risk for delayed recovery. This tool should assist primary care practitioners to identify problem areas that are likely to impact recovery from low back pain and institute appropriate triage procedures and early intervention. This, in turn, may result in improved functional status and reduce the impact of low back pain on military readiness. 450 patients enrolled to participate in the study. Using the Ambulatory Data System (ADS) administrative database, 368 cases did not have a prior medical visit according to the ADS administrative database. According to self-report and confirmation by the ADS database, 304 cases did not have a previous low back pain-related medical visit. Path analysis of data including a three-month post-baseline survey; job stress factors including innovation, involvement, and supervisor support at work; mental health; previous visits; and, ergonomic exposure were components of a model that significantly predicted the occurrence of a clinic visit for low back pain. A 12-month follow-up is planned. This investigation is supported by funds from the United States Army Center for Health Promotion and Preventive Medicine. Articles have been published in Pain (2001) and New Avenues for the Prevention of Chronic Musculoskeletal Pain and Disability (2002).

The Center for Force Health Protection Studies.

Mission. The Center for Force Health Protection Studies promotes the use of a systematic process to prospectively evaluate disease and non-battle injuries in military and veteran populations for guiding health policy development. The Center's goal is to enhance the scientific knowledge base for military deployment health and to develop recommendations for preventive health interventions. The Center develops databases, analytic methodologies, and models for predicting health outcomes, as well as for identifying and evaluating or designing specific interventions for preventing injury and illness. The Center disseminates information to promote force health protection and participates in interagency research and development programs. It also provides consultation to program managers and executives in the health-related components of the DoD, the Department of Veterans' Affairs, other Federal agencies, local governments, and private organizations. **Tomoko I. Hooper, M.D., MPH, Assistant Professor, USU SOM Department of Preventive Medicine and Biometrics, served as the Director of the Center during 2002.**

Research Activities. The focus of the Center's research is on studies that collect, manage, and integrate health-related data for purposes of risk assessment and risk communication to protect individuals who serve our Nation during peacetime and war. The Center conducts a comprehensive research program on the short-term and long-term health outcomes and experiences associated with training, deployment, combat, and humanitarian/disaster relief operations. For example, current efforts are underway to distill the findings of research across disciplines on the health outcomes associated with service in the Gulf War. Articles have been published in The Journal of Occupational and Environmental Medicine (2002) and The American Journal of Epidemiology (2002) and accepted at Military Medicine (2003).

Medical Events During Periods of Isolation: The U.S. Navy Submarine Force Experience. A NASA-funded study, *Medical Events During Periods of Isolation: The U.S. Navy Submarine Force Experience*, characterized medical conditions occurring among enlisted personnel and officers assigned to United States Navy submarines between January 1, 1997 and September 30, 2000. Medical encounter data from the Navy's Shipboard Non-Tactical ADP Program Automated Medical System (SAMS) was downloaded onto floppy disks by submarine Independent Duty Corpsmen (IDCs) following each underway period of ten days or greater. Medical and demographic data was extracted from SAMS using a download process designed for health studies. These data, along with an official Sailing List, were sent to study investigators for processing and analyses. SAMS data collection continued through September of 2000; data was received from a total of 249 submarine patrols. Four were excluded from analyses because patrol dates were outside of the study period and nineteen because of insufficient data. Data from the remaining 226 patrols were processed and included in the master database. Incidence density rates were calculated for specific medical conditions occurring during underway periods; the total number of person-days underway was used as the denominator for these rates. Results from the overall study were presented at the USU Research Day. Further analysis of the data continued throughout 2002; and, articles were submitted to the Undersea and Hyperbaric Medicine Journal and Aerospace and Environmental Medicine (following review by the United States Navy).

Epidemiologic Support of Health-Related Research Pertaining to Military, Veteran, and Dependent Populations. Collaborative research and consultative activities also continue under a working agreement with the Naval Health Research Center (NHRC) in San Diego, California. The program, *Epidemiologic Support of Health-Related Research Pertaining to Military, Veteran, and Dependent Populations*, is in its sixth year. USU faculty provide administrative and consultative support to the NHRC Research Program. The original protocol was amended in August of 2000, to reflect the evolution in the scope of the research program from the initial seven epidemiologic studies of Gulf War veterans to a more broad-based, public health-related research program involving active duty military and veteran populations. New research protocols have been developed in the following areas: 1) emerging illness research; 2) deployment health research; and, 3) other research involving military personnel, such as studies of anthrax and pneumococcal vaccines, complementary and alternative therapies, and pregnancy outcomes. Beginning in 2001 throughout 2002, 31 studies were in various stages of completion. These studies will add to the scientific knowledge base on a wide range of public health related topics, including epidemiologic methodology for population-based studies, reproductive outcomes, vaccination policy, predictors of social and family dysfunction, and tobacco cessation programs.

Numerous poster presentations resulting from these studies were presented by the Center faculty during 2002 at: the American College of Epidemiology Annual Conference in Albuquerque, New Mexico; the 130th Annual Meeting of the American Public Health Association in Philadelphia, Pennsylvania; and, the Eighth Annual Maternal & Child Health Epidemiology Conference held in Clearwater Beach, Florida.

The Center for Foreign Area Medical Studies.

Mission. The Center for Foreign Area Medical Studies advances the tenets of preventive medicine and public health in the tropics and in developing regions, with specific reference to health-related operations and interests of the DoD, other Federal agencies, local governments, and private organizations. The Center promotes, facilitates, and implements programs of research, consultation, education, and training in the related disciplines of tropical public health, tropical medicine, and environmental health in the developing world. **Center leadership during 2002 was provided by Larry W. Laughlin, M.D., Ph.D., Dean and Professor, USU School of Medicine.**

Education and Training. During 2002, the sixth presentation of the *Tropical Medicine and Traveler's Health Course* was a resounding success; the course is accredited by the American Society of Tropical Medicine and Hygiene (ASTM&H). All members of the class planned to take the ASTM&H Certificate of Knowledge Examination. Although there is a great deal of interest in next year's course, the greatest impediment to larger classes is the amount of time required to complete the course (12 weeks). The required density of the curriculum precludes any significant reduction in time; the PMB Director of Tropical Public Health recently reviewed the curriculum of the 12-week course with a view toward combing for efficiency, while maintaining standards for accreditation. The sponsorship of this course by USU developed through the Interservice Training Review Organization (ITRO) consolidation of the Army and Navy Tropical Medicine Training Programs. The course will continue to be housed and sponsored by USU; but, it remains an official function of the TriService System, with the Navy as the lead agent. During the past year, a major effort has been initiated to transition the USU courses on tropical medicine into a distance learning format; a grant submission is pending to fund this effort.

Malaria Research. The major thrust of this program has turned toward DNA vaccine development, in conjunction with major new fundings from the Office of Naval Research. A new five-year grant has been implemented to meet this change in focus. A significant genomics effort has been expanded under recent leadership.

Bartonellosis Research. A major new expansion effort has been initiated in the *Epidemiology of Bartonellosis*, including a consortium of USU grant submissions to study human, animal and vector population of areas endemic for Bartonellosis in Peru. A new area of study (epidemic site - Cusco, Peru) has been added in association with an epidemic documented in late 1998. Preliminary data was presented at a meeting on Bartonellosis in Montana during August of 2001, and an article was published in The Journal of Infectious Diseases during 2002.

Climate and Health. The relationship of climate and vector-borne infectious diseases has been suggested, but little supporting data is available. As climatic activity can be predicted by remotely sensed satellite images, the Center hypothesizes that predictive climatology can lead to the optimum use of insecticides in vector-borne disease control programs. Funding from a new grant will allow the association of current clinical disease activity with predictable climate changes.

The Center for Military Medical Analysis and Projection.

Mission. The Center for Military Medical Analysis and Projection provides a focus of expertise and experience in military medical data analysis and projection for research, consultation, validation, and education relating to the incorporation of available data into decision-making processes. The Center conducts epidemiologic research in military health, particularly relating to the hazards of military training and deployment, medical and health surveillance, and health data quality, coherence, and relevance to disease prevention and medical readiness evaluation. Most of this research focuses on the consolidation and evaluation of existing health, medical, and personnel information, rather than on generating new data. The Center provides opportunities for students and others to participate in specific projects, analyses, and evaluations. The Center works closely with the Center for Force Health Protection Studies. **David H. Trump, M.D., MPH, CAPT, MC, USN, Associate Professor, USU SOM Department of Preventive Medicine and Biometrics, served as the Director of the Center during 2002.** Doctor Trump published six articles during 2002, to include a manuscript in Military Medicine in 2002. In addition, CAPT Trump presented a poster at the Fourth Annual Army Force Health Protection Conference, held in Albuquerque, New Mexico.

Center Activities. Nine areas of study were continued during 2002:

The Assessment of Field Exposure to CS Gas (ortho-chlorobenzalamalonitrile) in United States Marine Amphibious Reconnaissance Training. Although funding ended in September of 2000, a study of the United States Marine Amphibious Reconnaissance Training was completed to provide an estimate of the levels of CS gas to which the trainees were actually exposed and a manuscript was submitted to the Journal of Applied Occupational and Environmental Hygiene (2001); in addition, the case report of the original CS exposure in United States Marine trainees was published in Military Medicine (2002).

A Review of Syphilis Data, 1987-1999, in Navy and Marine Corps Personnel. This was an unfunded project; the Center authors completed their analysis of syphilis cases reported among Navy and Marine Corps personnel and submitted a manuscript to Military Medicine, which was published in 2002.

Alcohol Use in Military Personnel and Military Readiness. This was an unfunded project; the Center investigators and their collaborators completed a study and prepared a manuscript entitled, *Mission Readiness and Alcohol Consumption among U.S. Navy Shipboard Sailors*. Also, a USU MPH student completed a secondary analysis of the 1998 DoD worldwide survey of health behaviors to explore the relationship between alcohol use and risk-taking sexual behaviors; this manuscript awaits clearance from Navy Public Affairs.

Post-Deployment Self-Assessment of Health. The Center investigators initiated a research project to examine military members' self-assessment of health at the conclusion of a deployment and their subsequent health outcomes and health care use; they have analyzed data from over 17,000 military members who returned from deployments in 1999. The DoD Medical Surveillance System (DMSS) provided person-level data from the DD Form 2796 Post-Deployment Health Assessments, military personnel systems, and military in-patient and out-patient data reports.

Collaboration with the Veterans Affairs Medical Center (VAMC), Washington, D.C., Center for the Study of War-Related Illnesses (CSWRI). The VAMC proposal to establish a center of excellence for research, education, risk communication, and clinical care in deployment/war-related illnesses was approved by the Department of Veterans Affairs. Initial funding of the VAMC CSWRI is for approximately \$5 million over three years. USU collaboration will be in the areas of epidemiologic research and the development of clinical education experiences for medical students and residents at VAMC and through clinical simulations.

Toxicological Assay Methods and Chemical Exposures among Marines in the Gulf War. CAPT Trump is a co-investigator on this Naval Medical Research Center/Centers for Disease Control and Prevention study. Pre- and post-deployment sera collected from a cohort of United States Marines during the Gulf War will be analyzed for selected toxic chemicals and mixtures using newly developed biomonitoring/biomarker methods and models. The United States Army Medical Research and Materiel Command funded the study through 2002.

Navy Occupational Lung Disease Assessment Project. Two Center investigators are members of the DoD advisory committee for the Congressionally-mandated Navy Occupational Lung Disease Assessment Project. This study is being conducted by the Naval Health Research Center (NHRC) and the Armed Forces Institute of Pathology (AFIP). USU hosted the initial meeting of the NHRC and AFIP investigators, the civilian scientific and public policy advisory committees, and the DoD advisory committee on September 10-11, 2001. This study was funded through 2002.

Exertional Heat Illness in Marine Corps Basic Training. During 2001, an article entitled, *Long-Term Follow-Up after Exertional Health Illness During Recruit Training*, was published in Medicine & Science in Sports & Exercise, Volume 33, pages 1443-1448. This work was the product of projects funded in prior years. Numerous other manuscripts related to exertional heat illness in Marine Corps recruit training have also been produced. For example, Center investigators completed a book chapter, *Clinical Diagnosis, Management, and Surveillance of Exertional Heat Illness*, for the Textbook of Military Medicine volume entitled Medical Aspects of Harsh Environments. Analysis continued throughout 2002.

Preventability of Exercise-Related and Infectious Disease Deaths. This grant from the Global Emerging Infections Systems, Walter Reed Army Institute of Research, provided starter funds for the collection of medical information on all deaths of military members on active duty. Funding through USU and the Center ended in September of 2001. The project continued during 2002, under the auspice of the MoD Medical Mortality Registry at the Armed Forces Institute of Pathology.

The Center for Oral Health Studies.

Mission. The Center for Oral Health Studies provides oral health care services information and dental public health education to the DoD, the TriService Dental Corps Chiefs, and other interested organizations. The Center gathers, synthesizes, and distributes management information needed to develop oral health care policies and programs necessary to optimize the oral health of DoD beneficiaries and the dental readiness of service members. **Andrew K. York, DMD, MPH, CAPT, USN, DC, served as the Director of the Center for Oral Health Studies during 2002.**

Center Activities. The Center has continued to be very active in two major areas: 1) the DoD Dental Patient Satisfaction Survey; and, 2) the 2000 TriService Recruit Comprehensive Oral Health Survey. The Center is responsible for the administration, analysis, and reporting of data from the DoD Dental Patient Satisfaction Surveys that are administered at 260 Dental Treatment Facilities (DTFs) worldwide. Each DTF returns approximately 100 completed surveys each month; and, over 415,000 surveys have been analyzed since September of 1999. The survey instrument takes advantage of optical scanner (bubble sheet) technology to facilitate data collection and analysis. Each of the 260 DTFs has a designated local survey administrator who is responsible for the distribution and collection of the 100 surveys each month. The Center developed and deployed a PC-based software tool for the survey administrators to use to ensure that a random sample of patients is selected each week to complete the survey immediately following their dental appointments.

The DoD Dental Patient Satisfaction Survey is currently an integral part of the measurement of overall Military Health System (MHS) performance. The quarterly results for each DTF, regional commands, services, and the MHS are reported on the TRICARE Operational Performance Statement (TOPS). The web site is <www.tricare.osd.mil/reptcard/tops/topsrept.html>. TOPS allows each organizational level to benchmark against other facilities, both military and civilian; and, TOPS also identifies trends from one quarter to the next. TOPS and the DoD Dental Patient Satisfaction Survey are effective in assisting the MHS in its continual efforts to improve performance in the delivery of dental care and services.

The 2000 TriService Recruit Comprehensive Oral Health Survey was conducted from January through July of 2000. The Calibration Course for the dental examiners was held in Bethesda, Maryland, during December of 1999; and, it was conducted by the USU Center. Over 4,300 Recruits were examined during this time frame at seven different sites. The sites were Lackland Air Force Base, Texas (Air Force); Fort Knox, Kentucky (Army); Fort Leonard Wood, Missouri (Army); Fort Jackson, South Carolina (Army); Great Lakes Naval Training Center, Great Lakes, Michigan (Navy); Marine Corps Recruit Depot, Parris Island, South Carolina (Marines); and, the Marine Corps Recruit Depot, San Diego, California (Marines). This survey allows for a direct comparison of the 1994 Survey of Recruits to determine if there are differences in oral health levels, prevalence of tobacco use, level of education, and dental readiness. In its summary of 2001, the Center reported that the overall DMTF Index for 2000 Recruits was 5.4 and for the 1994 Recruits it was 6.6. This indicates that overall, the 2000 Recruits had less **(D)**ecayed, **(M)**issing, or **(F)**illed **(T)**eeth than the 1994 Recruits.

During 2002, the Center faculty submitted *Dental Emergencies During Stabilization Force 8 in Bosnia*, which was accepted by Military Medicine; and, *Dental Readiness Classification Patterns During the First Four Years of Military Service* was also submitted to Military Medicine for publication. Also, presentations were made at the DoD Force Health Protection Conference in Baltimore, Maryland; the DoD Recruit Health Symposium in Baltimore, Maryland; the American Association of Public Health Dentistry Annual Meeting held in Boston, Massachusetts; and, the Dental Division of the Navy Bureau of Medicine and Surgery in Washington, D.C.

The Center for Population Health.

Mission. The Center for Population Health (formerly the Center for Health Care Quality Assessment) is an integral part of the research, service, and educational activities of the PMB Division of Health Services Administration. The Center's functions are carried out through two primary activities: a focus on patient safety; and, a focus on clinical performance analysis and improvement. The Center also develops innovative educational curricula and provides training to Federal health care executives and managers to create, manage, and improve high quality health systems. Through these activities, the Center provides expertise, experience, and insight for the assessment of large health care databases to determine trends in population health and care delivery and the efficiency and effectiveness of care delivery processes. This performance analysis includes the linkage of practice patterns and support structure and policy to health outcomes. The analysis also focuses on the major issue of patient safety in the health care system and its processes and the identification of appropriate actions to limit risk and to improve the system. Both primary activities lead to the development of educational material for medical students, active practitioners, and policy makers to improve the safety and effectiveness of the Federal Health Care System. The Center for Population Health is currently sponsored by projects with the Agency for Healthcare Quality and Research, California State, the United States Military Cancer Institute, and HRSA. **Galen Barbour, M.D., FACP, FACHE, Professor, USU SOM Department of Preventive Medicine and Biometrics, served as the Director for the Center during 2002.**

Center Activities. The Center is specifically *designed to enable Federal health care providers and administrators to access comprehensive, integrated, population-based performance information to facilitate quality improvement and cost reduction and demonstrate the value and power of the combined Federal health care systems to the American Public.* The following was included in the Center's summary report for 2001-2002:

Integrating Clinical Managerial Decisions to Improve Population Health. This five-day training course is held five times each year; it responds to a Congressional mandate that current and prospective DoD health care leaders receive training in health care management and administration. To date, 29 sessions have been held in the TRICARE Regions; and, approximately 850 senior officers have been trained for the Military Health System. During 2002, the faculty extended their expertise to five additional TRICARE Regions.

The Medical Executive Skills Distance Learning Program. The Medical Executive Skills Distance Learning Program continues to be presented four to five times a year throughout the MHS. Several of the previous presentations have been developed into distance/distributed learning formats and are presented prior to the formal on-site class via web-based mechanisms. Learning accomplishments of the presentations are measured and reflected in the changes seen from a pre-test and post-test analysis using qualitative questions derived from the material in the on-site and web-based presentations. Future years' plans call for the full implementation and evaluation of the Medical Executive Skills Distance Learning Program to include 10 to 14 on-line modules. Additional studies, which will follow on-going research on workforce modeling and quality assurances, are expected. Complete on-line registration and student pre-tests were incorporated into two traditional courses this past year and are now routine procedures. It is anticipated that a total of six to eight distance learning modules will be up and running in the near future.

Application of the Tools of Clinical Epidemiology in Health Services Management. The Center sponsors training programs for senior DoD physicians in the application of the tools of clinical epidemiology in health services management. This program has expanded to include mid-level military health care professionals. Additionally, the Center plans to pursue research in small area analysis regarding visit intervals for chronic diseases; the relationship of costs to visits in the MHS will also be examined.

The USU School of Medicine Department of Military and Emergency Medicine and the Casualty Care Research Center.

The CCRC Mission is to serve as a unique national resource by providing quality research, education, and expertise in the delivery of good medicine in bad places.

- Mission Statement Approved by the President, USU, 1995.

Establishment and Mission. The Casualty Care Research Center (CCRC) was established in July of 1989, under the USU SOM Department of Military and Emergency Medicine as a center of excellence for injury control and casualty care research.

In keeping with the overall mission of USU, the scope of the CCRC activities includes the following: 1) conducting research and investigations on issues relating to injury control, casualty care, operational, and disaster medicine; 2) providing a disciplined, educational, research experience in combat casualty care, injury epidemiology, trauma management, and related areas to medical students, graduate physicians, and other uniformed medical personnel; 3) serving as a repository of resources and information relating to injury control, injury epidemiology, and operational medicine for the Uniformed Services; and, 5) providing research, resource and educational support, technical assistance, and other community service to USU, the Uniformed Services, and other Federal, state, and local elements. The Center operates entirely on extramural funding; it employs nine full-time personnel and is supplemented by ten part-time civilian volunteers and military officers loaned on an intermittent basis by their parent commands. Personnel within the USU Department of Military and Emergency Medicine participate in various activities of the CCRC based on their professional interests and as their teaching and clinical responsibilities permit. The Center's efforts fall into three categories: research, training, and consultative/operational support. **Mr. Joshua Vayer, Research Assistant Professor, USU SOM Department of Military and Emergency Medicine, serves as the Director for the Center.**

Core Military Competency. The location of the CCRC within the multi-Service environment of USU, with its emphasis on education and development, scientific studies, research, and on-going clinical and operational practice, is critical to the development and sustainment of the CCRC's ability to maintain its core competency - *the capability to provide military-unique, medical expertise and experience required by both uniformed and civilian emergency/health care responders to weapons of mass destruction (WMD)-related and other national security contingencies.* Only DoD has a self-renewing source of physicians and other medical personnel with interest and experience in these areas. USU, through its students in the School of Medicine and the Graduate Education Programs and its career-focused faculty and staff, plays a vital role for the DoD in the renewal process of militarily-focused and experienced health care providers. The University ensures continuity and leadership for the MHS; and, the CCRC's core competency plays an essential role in that equation.

First responders suffer from shifting federal priorities, bureaucratic rivalries, and poorly designed training programs.

- Government Executive, *Emergency Assistance*, November 2002, pages 18-27.

Contributions to Homeland Security - The Integrated Force Health Protection Program. Since 1989, the CCRC has successfully served as a bridge between DoD and Civilian Emergency Responders for the coordination and sharing of critical, military-unique medical knowledge, technology, and expertise. Initially, the CCRC Program was a cooperative effort between USU, the Department of Defense Office of Drug Enforcement Policy and Support, the Henry M. Jackson Foundation for the Advancement of Military Medicine, and the Department of Interior, United States Park Police Special Forces Branch. From 1990 through 2001, the CCRC Program was continuously funded by the Office of Drug Enforcement Policy and Support, which reported through the Assistant Secretary of Defense for Special Operations/Low Intensity Conflict. Currently, the Program has been supported through special congressional funding for Chemical/Biological/Radiation/Nuclear/Explosive (CBRNE) Training. The Program's policies are governed by a Board of Directors representing military medicine, law enforcement, and pre-hospital care communities.

The Integrated Force Health Protection Program focus is on crisis management response to: *weapons of mass destruction (WMD); counter terrorism; protective operations; hostage rescue; explosive ordnance disposal; maritime operations; civil disorder; and, major national security events.* To date, the CCRC Program has trained over 6,000 civilian emergency personnel from 750 agencies through collaborative support agreements with law enforcement organizations from all 50 States, the District of Columbia, Guam, Puerto Rico, the United States Virgin Islands, England, Denmark, and Canada. Forty local, state, and Federal law enforcement agencies mandate this CCRC certification-based training as a condition of employment for their SWAT medics. It teaches skills that reduce the risk of death or serious injury during counter terrorist operations, drug raids, hostage situations, and other high risk operations for DoD personnel and, on a reimbursable basis, for personnel from other Federal, state, and local agencies. In October of 2002, the Secretary of Defense recognized the exemplary response by CCRC to the terrorist attacks on September 11th, when he awarded the Exceptional Civilian Service Award and the Secretary of Defense Meritorious Civilian Service Award to several CCRC personnel. The superb support of the CCRC was also recognized on February 28, 2003, when the Honorable Gail Norton, Secretary of the Interior, presented a Unit Citation Award to the CCRC in recognition of support provided to the United States Park Police on September 11, 2001.

The Program provides *military-unique, national standard, assessment-driven curricula; certification; and, a quality assessment process* that exist nowhere else. Its unique Special Operations Injury Epidemiology Database, the only database of its kind, ensures both effectiveness and relevance during the generation of assessment-driven curricula; and, it provides information/data for research on injuries incurred during the crisis management of domestic contingency operations. *The data derived through this CCRC Program is utilized by DoD to explore the epidemiology of injury and the impact of various medical interventions.*

The Integrated Force Health Protection Program has received the endorsement of, and/or continuing medical education credit from: The National Tactical Officers Association; the National Association of Emergency Medical Technicians; and, the Continuing Education Coordinating Board for Emergency Medical Service. The CCRC's maturing relationship with the law enforcement community as a principal consultant for medical support for Federal law enforcement special operations in the United States has resulted in the transfer of valuable knowledge, experience, and technology for military medical application. This information is used to guide the educational components of the CCRC Programs and to explore similarities and differences between the experiences of the civilian law enforcement communities and the military special operations forces; thus, it contributes to medical readiness. *For example, during 1996, these collaborative efforts led to a significant change/enhancement*

in the training programs for the Navy SEALs. The CCRC has received multiple testimonials from faculty and students who attribute their success in planning medical support for the deployment of military units in the field directly to knowledge gained at the CCRC. Medical readiness/mission support was also provided by CCRC following the bombing of the United States Embassies in East Africa, to include preventive medicine, field sanitation and hygiene, medical intelligence, acute care, and clinical forensic medicine. Critical medical coverage of security forces and protectees, following 9/11, was provided by CCRC for several weeks, which supported efforts for the continuity of government.

As the CCRC's largest training program, the Integrated Force Health Protection Program, offers the following medical/evidence-based courses: *EMT-Tactical; the Advanced School; the Commander's Course; the Medical Director's Course; and, the Instructor Development School.* These CCRC courses receive maximum attendance. For example, the Medical Director's Course, presented at the 2002 Annual Meeting of the National Association of EMS Physicians, once again received unprecedented attendance. Participants in these courses also include medical students, graduate physicians, special operations medics from all of the Services, and selected Federal law enforcement medics. In addition, the CCRC can provide training with an array of hand-held PC-based knowledge management tools and guides, such as the *ChemBio Toolkit*, currently being adapted for the Navy and the National Institutes of Justice, which guides a commander through the steps of handling a suspicious mailroom package or an abandoned briefcase and provides a probability based threat assessment and agent identification. *The location of this CCRC Program within the University ensures academic oversight and credibility for the Congressionally mandated collaboration between DoD and the civilian emergency personnel community.*

WMD Scientific Training Programs. The CCRC provides a family of seven WMD medical educational programs to meet the needs of a variety of communities. These include *Responding to WMD for Health Care Facilities, Responding to WMD for Health Care Providers,* and *WMD Awareness: What Everyone Needs to Know.* These programs have been highly acclaimed because of their effectiveness and efficiency; and, they are being reviewed as a model for Military Treatment Facility (MTF)-based training. The CCRC continues to receive requests from health care facilities and their staffs for this training. In 2002, the CCRC, at the request of the Maryland Health Education Institute, conducted several courses for local and regional medical personnel. Those individuals returned to their facilities and have subsequently generated a considerable volume of requests for further training and guidance on weapons of mass destruction (WMD) issues.

The Wound Data and Munitions Effectiveness Team (Vietnam) Database (WDMET) - A Unique Resource. The Wound Data and Munitions Effectiveness Team (Vietnam) database (WDMET) is maintained by the CCRC. It contains information on the tactical engagement, weapons employed, resulting injuries, and treatment in the pre-hospital and hospital environments on approximately 8,000 combat casualties. It is the only collection of its kind in the world. Photographs, medical records, X-rays, recovered bullets and fragments make this a unique resource, which has been studied extensively, resulting in numerous scholarly publications since the establishment of the Center. Most recently, the WDMET data has been used to support the *Persistence in Combat Project*, which is sponsored by the Defense Advanced Research Project Agency (DARPA).

CCRC Mission Support Center and Operational Medical Support. In agreement with the philosophy that teachers and scholars must maintain an active practice in their areas of expertise to ensure competency, the

Operational Medical Support Programs of the CCRC provide consultation and support to multiple organizations, including the White House Medical Unit, the Federal law enforcement community, and numerous national security contingencies. These activities are carried out under appropriate Memoranda of Understanding. On the average, the CCRC Mission Support Center responds to at least one request for support each day; it is staffed by uniquely trained personnel who provide medical informatics, consultation, planning, and threat assessment support on a round-the-clock basis. These support-related activities serve as a suitable vehicle for USU faculty, both billeted and off-site, to develop and maintain their expertise in operational medicine. *Participation in actual missions lends important credibility to teaching and research and provides a living laboratory where concepts, techniques, and technology can be evaluated.* The Secretary of Defense has commended the CCRC for its contingency support for the Republican National Convention and the Presidential Inaugural and the direct service support to the Departments of State, Treasury, Interior, and Justice. Based upon the similarities between military medicine and selected types of civilian emergency medical support, lessons learned can be applied from one to the other. The increasing frequency of military operations other than war, including responses to terrorist activities, makes the law enforcement special operations experience critically relevant to military medicine.

CCRC Emergency Medicine Resident Rotation. The CCRC's Emergency Medicine Resident Rotation in Operational Medicine Course, initiated in 1992, is a five-week elective for military emergency medicine residents. Eighty active duty emergency medicine residents, six active duty staff physicians, and three physician assistants have completed the course. It consists of successful performance in the one-week Integrated Force Health Protection Program EMT-Tactical (IFHP/EMT-T) School and four weeks of temporary duty at the CCRC. While assigned to the CCRC, the emergency medicine residents deploy on actual support missions, complete short research projects, and generate *white papers* on topics such as antibiotic selection, malaria prophylaxis in high risk special operations, and field laboratory diagnostics for chemical, biological, and radiological incidents. In 1998, the three Surgeons General suggested that the elective be made a required rotation for all military emergency medicine residents. This year, the CCRC signed an agreement to train, during every month, residents from the Joint Service (Army/Air Force) Emergency Medicine Residency Program in San Antonio, Texas.

CCRC Military Medical Field Studies Rotation. The Military Medical Field Studies Rotation at the CCRC accommodates up to twenty first-year medical students with prior service for the required military experience between the first and second years of medical school; if required by the Services, this number could be increased. Up to six fourth-year medical students complete an elective rotation in operational medicine research at the CCRC each year; again, the number of students could be increased if required by the Services. The operational experiences of the CCRC Medical Support Teams are integrated throughout the medical school curriculum as tangible demonstrations of the medical science being taught. For example, a large part of the USU SOM curriculum on blast injury uses the first-hand experiences of the CCRC faculty acquired during their response to the embassy bombings in East Africa.

During 2002, approximately 18 students, between their first and second year of medical school, selected an area of interest and worked with CCRC faculty members on individualized courses of research and study. The students were also divided into groups; each group was responsible for completing a research effort and for a presentation of findings. Students attended one or more of the following CCRC training opportunities: *the Emergency Medical Technician Tactical (EMT-T) Course*; *the Emergency Medical Technician - Tactical Advanced Course*; or, *the Weapons of Mass Destruction (WMD) Training Program*.

The Sixth International Conference on Tactical Emergency Medical Support. The USU CCRC hosted the Sixth International Conference on Tactical Emergency Medical Support, which was held from June 7-9, 2002, in Las Vegas, Nevada. Once again, the CCRC was proud to sponsor a conference that is consistently well attended and offers significant integration with the law enforcement and public safety communities. This year's conference was entitled, *Protecting the Protectors*, and included a Keynote Address by Lieutenant General Frank Libutti, USMC (Retired), Deputy Commissioner for Counter-Terrorism, New York City Police Department. Presentations provided by personnel involved directly with the World Trade Center and Pentagon catastrophes were well received, as were presentations from several other clinicians and operators in the fields of Tactical EMS and Special Operations Medicine. The 2002 David Rasumoff Memorial Award for Heroism was presented to John Busching of the New York City Police Department Emergency Services Unit for his selfless acts of bravery following the terrorist attacks at the World Trade Center.

USU School of Medicine Department of Military and Emergency Medicine and the Center for Disaster and Humanitarian Assistance Medicine.

Establishment. The Center for Disaster and Humanitarian Assistance Medicine (CDHAM) was established in September of 1998, under the USU SOM Department of Military and Emergency Medicine to advance the understanding and global delivery of disaster medical care and humanitarian assistance. The Center ensures specialized expertise, consultation, training, education, and research for medical support activities that impact homeland defense, terrorism and disaster response, and humanitarian assistance. Personnel within the USU Department of Military and Emergency Medicine participate in various activities of the CDHAM based on their professional interests and as their teaching and clinical responsibilities permit. **Craig H. Llewellyn, M.D., Professor and Former Chair, USU SOM Department of Military and Emergency Medicine, serves as the Director for the Center.**

Mission. The mission of CDHAM is to advance the understanding and delivery of disaster medical care and humanitarian assistance on a worldwide basis. Uniquely positioned as an academic center within the USU, the CDHAM has served as a focal point in the Military Health System to: 1) develop relationships between various governmental, non-governmental, and private volunteer organizations; 2) assist in the critical management of relief efforts in the medical response to weapons of mass destruction, terrorism, natural disasters, and humanitarian assistance contingencies through new developments in the areas of disaster and humanitarian assistance medicine (such as ultrasound imaging training for disaster response or the use of PDA/handheld computer software platforms for disaster needs and assessment); and, 3) augment the training of military medical officers through specialized expertise, consultation, training in the field of Telemedicine and medical informatics in relation to the austere environment, education, and research capabilities.

Center Activities. The CDHAM uses training, technology, and best management practices to improve military medical capabilities and readiness during disaster and humanitarian contingencies, especially through collaboration with the inter-agency process, the international medical community, and the host nation medical infrastructure and beneficiary populations. The CDHAM works closely with the Unified Combatant Commands to meet its primary mission. Such efforts generally involve direct liaison with other DoD humanitarian assistance centers such as: the Center of Excellence (COE) for Disaster Management and Humanitarian Assistance under the United States Pacific Command (USPACOM) located in Honolulu, Hawaii; and, the Center for Disaster Management and Humanitarian Assistance (CDMHA) under the United States Southern Command (USSOUTHCOM), located in Miami, Florida.

In conducting studies and operations concerning local and global relief efforts, the CDHAM also works to expand relationships with other United States government agencies such as the Office of Foreign Disaster Assistance (OFDA) and the United States Agency for International Development (USAID), as well as international organizations such as the Pan American Health Organization (PAHO) and the World Health Organization (WHO). During 2002, CDHAM was actively engaged in various studies supported by the Department of Defense (DoD), the Unified Combatant Commanders, and other Federal agencies. A summary of the CDHAM's activities during 2002 follows.

Research and Operations.

Measures of Effectiveness. The DoD has the World's finest deployable medical system, and as such, it is routinely engaged in providing international medical humanitarian assistance. Scenarios in which military personnel provide medical humanitarian assistance range from deliberately planned theater engagement activities, to contingency operations, and complex human emergencies and military operations other than war. *A series of reports examining the training value of medical humanitarian assistance projects and their effectiveness for beneficiaries was completed by CDHAM during 2002.* Additionally, a study on the positive and negative effects of humanitarian assistance projects on the recruitment and retention of uniformed medical personnel was also conducted. Many uniformed offices have had prior humanitarian experience within DoD and with private volunteer organizations (PVOs) or non-government organizations (NGOs); a majority of those interviewed indicated that the opportunity to provide humanitarian health care was indeed a factor in their consideration to join the Uniformed Services.

A total of nine reports in the series on **Measures of Effectiveness** have been approved for public release by the sponsoring organization, the Office of the Assistant Secretary of Defense for Stability Operations (ASD/SO), formerly titled Special Operations and Low Intensity Conflict (SO/LIC). When printed, the reports will support USU Military Medical Humanitarian Assistance Courses and the Unified Combatant Commands, which annually conduct over 200 planned humanitarian missions; over half of those missions are health-related. Although international media coverage of complex humanitarian emergencies has been extensive, comparatively few academic investigations of such missions have been conducted. The **Measures of Effectiveness Reports** on military humanitarian assistance establish a model for conducting improved joint training for such missions and for providing effective relief. The nine reports in the series on **Measures of Effectiveness** are: 1) *Overview of Overseas Humanitarian Assistance, Humanitarian and Civic Assistance, and Excess Property Programs*; 2) *Humanitarian and Civic Assistance Projects and Military Training*; 3) *Measuring the Effectiveness of Department of Defense Humanitarian Assistance*; 4) *United States Participants Perspectives on Military Medical Humanitarian Assistance*; 5) *Host Nation Participants Perspectives on Military Medical Humanitarian Assistance*; 6) *Information Management for More Effective Humanitarian Assistance Projects & Programs*; 7) *Measuring the Effectiveness of Humanitarian Assistance other than Department of Defense Providers*; 8) *Humanitarian Service: Recruitment & Retention Effects Among Uniformed Services Medical Personnel*; and, 9) *Humanitarian Assistance Bibliography: with Some Annotations, After Action Reports, and Web Sites of Interest.*

Rapid Assessment. Efficient means for assessing the effects of a disaster event are essential for the direction of coordinated relief efforts. *Rapid assessments must identify and document:* the immediate needs of an effected population; the ability of local authorities to meet those needs; and, actions that should be taken by the international community to support the local authorities. *The priorities of rapid assessment are to:* determine what has to be accomplished in the immediate future to alleviate suffering; prevent loss of human life; and, establish a foundation for a cohesive and effective disaster response. However, while DoD assets can be tasked to conduct disaster assessments and can serve as an integral part of international disaster response efforts, there are strict guidelines governing the use of DoD personnel and assets in disaster relief operations, which must be observed. To address these requirements, an additional CDHAM study entitled, *An Analysis of the Involvement of United States Department of Defense Personnel in Rapid Assessment Surveys Following Natural and Man-Made Disasters*, was funded and approved for public release by the Office of the Assistant Secretary of Defense

for Stability Operations (ASD/SO) during 2002. This CDHAM report provides an analysis of DoD personnel involved in conducting rapid assessments following natural and man-made disasters and it also deals with the guidelines governing the use of DoD personnel and assets.

Gorgas Laboratory. In 2001, a collaborative study between the CDHAM and the Instituto Conmemorativo Gorgas de Estudios de la Salud (ICGES) was funded by the United States Southern Command (SOUTHCOM) to identify health research and capacity enhancements that would strengthen the local capacity for prevention and response before, during, and following man-made or natural disasters. *The goal of the study was to support the development of national and regional capabilities and cooperative training activities, as well as to strengthen the United States government programs in Panama* in areas such as: disease and injury surveillance; prevention of infectious diseases; humanitarian and disaster relief assistance; and, control of health threats associated with the accidental or incidental release of hazardous substances and toxic industrial compounds.

In accordance with one of the short-term recommendations identified in the initial USU-ICGES Study, *an integrative project was executed with the DoD-Global Emerging Infections System (DoD-GEIS) to increase the sub-regional expertise in laboratory-based epidemic outbreak surveillance.* A conference, co-sponsored and organized by CDHAM, served as the venue for this effort, during 2002. The *Phase II Course/Workshop on the Public Health Laboratory Information System (PHLIS) for Central America and the Dominican Republic* was held in Panama City, Panama, as requested by SOUTHCOM. The conference, hosted by the Gorgas Institute's Public Health Central Reference Laboratory in Panama City, Republic of Panama, included breakout sessions in disaster preparedness medicine and a two-day working meeting for the public health laboratory directors from the seven sub-regional countries in Central America, in addition to Panama and the Dominican Republic. The training at the Panama conference was collaboratively planned, organized and implemented by DoD-GEIS, CDHAM, the Pan American Health Organization (PAHO), and the Pan American Health and Education Foundation at the request of SOUTHCOM; it was funded by DoD Overseas Humanitarian, Disaster, and Civic Aid (OHDACA).

A synergistic, multi-agency approach for the implementation of the Centers for Disease Control (CDC) Public Health Laboratory Information System (PHLIS) was adopted to further expand and strengthen the national and sub-regional public health laboratory surveillance efforts in Panama, the six other Central American countries, and the Dominican Republic (PHLIS is an automated, standardized, computerized laboratory program for tracking, reporting, and communicating timely health surveillance information to decision-makers and first responders). *The objective of the integrative project was to improve and enhance human health resources capacity and health system capabilities for national public health authorities when providing humanitarian assistance to prevent and control emerging or re-emerging infectious diseases.* As a result, the main objective in the development of this public health intervention process was to ensure the fortification of early warning capabilities for disaster health information systems, *especially between the reference laboratories and the epidemiology departments*, to support contingency planning and the management of emergency situations resulting from natural or man-made disasters.

A multi-disciplinary group of 30 Ministry of Health professionals (epidemiologists, bio-informatics, and laboratory directors) from eight countries (El Salvador, Guatemala, Belize, Nicaragua, Honduras, Costa Rica, the Dominican Republic, and Panama) attended. The Panamanian Minister of Health was an active participant in the opening session of the workshop; and, 15 professionals from Panama participated as organizers, course facilitators, administrative support personnel, and course participants. *Specific outcomes of the training sessions reflected that the mutually reinforcing elements of the regional laboratory surveillance network were strengthened; and, advanced training in PHLIS configuration had been successfully delivered.*

Telemedicine Operations and Technology Cell.

Telemedicine Training for the Medical Department of the Mexican Army. The CDHAM serves as a clearinghouse for pertinent information related to all areas of disaster medicine and humanitarian assistance. The Center maintains access to expertise in the field of telemedicine and medical informatics as it relates to the austere environment. During Fiscal Year 2000, the CDHAM, under contract with the Joint Forces Command, prepared and conducted a wide range of activities. One offshoot was the evolution of a *Telemedicine Training Course/ Telemedicine Capabilities Overview* for select personnel within the Medical Department of the Mexican Army. In addition to its defense mission, the Mexican Army has the added responsibility of being a first-time responder to disasters and other catastrophic events; it was jointly determined that the Telemedicine technology currently used by CDHAM would lend itself well to the Mexican Army's requirement to provide humanitarian and disaster assistance. A further determination was also made that this technology would also be a viable tool for linking remote medical clinics with the central Mexican hospital.

Preparation by CDHAM began six months prior to deployment; a revision was made to the CDHAM Telemedicine Course Manual to reflect the needs of the Mexican Army (the complete translation of the Manual into Spanish is on-going). All presentations were finalized and then translated into Spanish. Approximately one month prior to deployment, all of the Telemedicine equipment was transported to Laredo, Texas, from where the equipment was relocated to Mexico City. An eight-member CDHAM team departed in November for Mexico City. Six Mexican military physicians were assigned to the CDHAM Training Team to assist in the preparation and implementation of the course. During this time, the Mexican physicians were exposed to the history and usage of Telemedicine, to include adequate time for hands-on training; the six Mexican physicians then served as Assistant Instructors during the training sessions; and, for the final training phase, they became the Primary Instructors for the Operators Course. The training courses consisted of a two-day, *Intensive Training Course*; two, one-day, *Austere Telemedicine Executive Overviews*; and, two, three-day, *Austere Deployable Telemedicine Operators Courses*.

Once the Intensive Training Course was completed, the CDHAM Team conducted a one-day, *Austere Telemedicine Executive Overview Briefing* for members of the Office of the Mexican Army Medical Chief of Staff. A total of 27 personnel were briefed, including one general officer. The following day, a three-day, *Austere Telemedicine Operators Course* was initiated with 16 personnel from the various branches of the Mexican Army medical community participating. Class composition was largely composed of primary care providers along with representatives from the Signal Services. During the following week, another *Telemedicine Executive Overview Briefing* was provided by CDHAM and attended by the staff of the Mexican Army General. A total of 57 personnel attended, of which, 13 were General Officers and 30 were at the rank of O-6. The final class of 16 personnel was conducted by the Mexican personnel who had been assigned to the CDHAM team. Periodic refresher/sustainment (annual or biannual) training is being considered to reinforce the skills learned in the Telemedicine Courses. Also, the technology used in Telemedicine changes rapidly and necessitates the updating of previously trained personnel in current technologies and methodologies. Future missions will also include at least one set of Deployable Telemedicine Equipment that can either be given to, or hand-receipted to, the host nation for future training/contingency operations.

Training.

Combined Humanitarian Assistance Response Training (CHART) Course. The CDHAM hosted training for 60 attendees for the Combined Humanitarian Assistance Response Training (CHART) Course in May of 2002. The CDHAM staff, along with invited faculty, presented the *Day-4 Medical Training Lesson Plan*; this was the subject of an organizational meeting sponsored by the Office of the Assistant Secretary of Defense, Special Operations Low Intensity Conflict, in order to update CHART training by the Center of Excellence in Disaster Management and Humanitarian Assistance.

Medical Preparedness for Manmade Disasters. The CDHAM participated in a one-day, pre-conference workshop for community emergency/first responder civil authorities, border health workers, and military personnel of the United States and the Mexican Armed Forces as part of the 60th Annual Conference of the United States-Mexico Border Health Association (USMBHA). The workshop sponsors conducted a bioterrorism exercise simulated to occur along the United States-Mexican border; *the CDHAM provided real-time, hands-on demonstrations using commercial, off-the-shelf telemedicine equipment.*

Military Medical Humanitarian Assistance Courses (MMHAC). Using the model of a course developed by the USU SOM Department of Pediatrics, *the CDHAM continued the development of a family of specialty-specific, intensive Military Medical Humanitarian Assistance (MMHAC) Courses across the spectrum of medical, nursing, and veterinary medicine specialties.* The CDHAM plans to complete the development of the MMHAC Courses during 2003, and to provide on-line support for the education and training of personnel assigned to participate in humanitarian or disaster relief activities.

Kerkesner and Bushmaster. The CDHAM supports the education of USU medical students during the first-year of medical school (Kerkesner) and fourth-year (Bushmaster) operational training courses. Live demonstrations of telemedicine equipment and medical informatics in relation to the austere environment are presented under actual field operating conditions.

Public Service Recognition Week. The CDHAM staff provided an interactive display on Telemedicine for the general public during the annual Public Service Recognition Week hosted by DoD on the Mall in Washington, D.C.

CDHAM Consultative Support.

The CDHAM provides telephone and on-site consultation for organizations requiring timely expertise in all phases of disaster mitigation. Consultative support with response planning, vulnerability assessment, needs assessment, medical care, and epidemiological surveillance is available.

A Guide for Non-Government Organizations. A CDHAM project to facilitate the coordination of disaster relief and/or humanitarian assistance relief between DoD, non-government organizations (NGOs), and private volunteer organizations (PVOs), led to the completion of a draft, 240-page document, which was updated five times during 2002. When finalized, *A Guide to NGOs: A primer about private, voluntary, non-governmental organizations that operate in humanitarian emergencies globally* will be promulgated on the CDHAM web site for rapid access by anyone seeking information on organizations that support disaster relief/humanitarian assistance activities. Publication will take place during 2003.

The CDHAM Web Site. The CDHAM web link, on the USU Home Page Web Site, continues to be updated and enhanced to assist in the dissemination of quality information relevant to the medical management of injuries caused by chemical, biological, radiological, nuclear, and/or high explosive weapons used in warfare and terrorism. *A work in progress*, the functionality of the link is being modified to *mine data* across a wide range of international and national, government and private Internet resources to rapidly direct interested users toward critical information for use in planning and responding to humanitarian assistance and/or disaster relief needs on a worldwide basis. The CDHAM web link can be reached at <http://www.usuhs.mil>.

Other Activities and Relationships.

Humanitarian Training Program for the San Antonio Military Pediatric Center, Joint Pediatric Residency Program, Honduras. As part of United States Joint Task Force Bravo Deployment in Honduras for pediatric residency training, a team from the United States military worked with the local Honduran health staff and Joint Task Force Bravo Honduran Medical Liaisons to collect data and identify information to compliment the Honduran long-term health and nutrition objectives. The CDHAM provided consultation, training, and faculty support, as well as funding support, for a medical student to participate in the deployment exercise; this resulted in an exceptional training experience for the medical student relevant to nutrition assessment and medical support in an austere humanitarian assistance environment.

Medical Support to a Medical Readiness Training Exercise in Uganda. The CDHAM provided funding support for one USU SOM student to participate in a European Command (EUCOM)-sponsored Medical Readiness Training Exercise in Uganda, Africa. This resulted in another exceptional training experience for a medical student from the University.

USU School of Medicine Department of Surgery and the Center for Prostate Disease Research - A TriService Effort.

The Department of Defense Center for Prostate Disease Research (CPDR) of the Uniformed Services University of the Health Sciences in Bethesda, Maryland, announces its 10th Anniversary Celebration on November 22, 2002. This all-day celebration will feature a keynote address by the Director of the National Cancer Institute, Dr. Andrew von Eschenback, as well as presentations by other nationally recognized experts in the prostate cancer field.

- *USU E-News*, Winter Edition, 2002, page 10.

Background. The Center for Prostate Disease Research (CPDR) is a United States Department of Defense Program located in Rockville, Maryland, which integrates basic and clinical science to develop promising detection techniques and treatments for prostate cancer and disease. The CPDR was established in 1991, by the United States Congress in an effort to combat the increasing rate of occurrence of prostate cancer and celebrated its 10th Anniversary in 2002. Current figures released by the American Cancer Society reveal that over 189,000 American men will be diagnosed with prostate cancer each year and that approximately 30,000 of those men will die from the disease.

The CPDR is a program of the Uniformed Services University of the Health Sciences (USU) located in Bethesda, Maryland; it is affiliated with the Walter Reed Army Medical Center, the Armed Forces Institute of Pathology (AFIP) located in Washington, D.C., as well as nine, TriService (Army, Navy and Air Force) Military Medical Centers. The CPDR is administered by the Henry M. Jackson Foundation for the Advancement of Military Medicine. With over 80 researchers and team members, the CPDR is recognized as one of the prominent prostate cancer research programs in the Nation.

Mission. The CPDR is unique, in that it incorporates three distinct areas of prostate disease research into one comprehensive program. In particular, clinicians are working closely with basic scientists, pathologists, and other medical researchers to advance the field. **Colonel Judd W. Moul, MC, USA, Urologic Oncologist, Walter Reed Army Medical Center (WRAMC), Professor, USU SOM Department of Surgery, and Colonel David G. McLeod, MC, USA, Urologist, Walter Reed Army Medical Center (WRAMC), Professor, USU SOM Department of Surgery,** serve as the Directors of the Center for Prostate Disease Research.

Center Activities During 2002.

Clinical Research Center. The CPDR Clinical Research Center, located at the Walter Reed Army Medical Center (WRAMC) in Washington, D.C., combines prostate screening, data collection, clinical diagnosis, education and counseling, and, most importantly, prostate disease clinical trial research in a distinctly patient-oriented setting. In the Clinical Research Center, CPDR Directors, Colonel Judd W. Moul, MC, USA, and Colonel David G. McLeod, MC, USA, and their team provide state-of-the-art care to military beneficiary patients affected by prostate disease, particularly emphasizing enrolling military beneficiaries in clinical trials.

TriService, MultiCenter National Prostate Cancer Patient Database. The CPDR Patient Database is one of the largest, most comprehensive prostate cancer patient databases in the country. After informed consent, patients provide comprehensive data about their care, which is maintained in a state-of-the-art relational computer database. **Leon Sun, M.D., Ph.D., MultiCenter Database Administrator, Research Assistant Professor, USU SOM Department of Surgery,** and **Colonel Judd W. Moul, MC, USA,** direct this monumental project, which is administered, nation-wide, by principal investigators and database managers at nine TriService Military Medical Centers. *The CPDR database has evolved into a valuable research tool for both clinicians and scientists working in the prostate disease field. Currently, there are more than 500,000 records on over 17,000 patients in the database.* Recently, CPDR was awarded a 3-year (2002 through 2005) DoD Prostate Cancer Research Program (PCRP) Grant in the amount of \$410,000 to add technological advancements to the CPDR TriService Multicenter Database. In addition, important studies are underway in multiple areas including: hormonal therapy for early disease recurrence; the efficacy of watchful waiting; the relationship of biochemical recurrence to mortality; and, the comparison of surgery to radiation for the treatment of localized disease.

Basic Science Research Program. In the Basic Science Research Program of CPDR, 2002 proved to be a great success for research productivity. Under the direction of **Shiv Srivastava, Ph.D., CPDR Scientific Director, USU SOM Research Associate Professor, Department of Surgery,** the Basic Research Program of the CPDR now includes more than twenty-five cancer researchers including the **Associate Director, Dr. Johng Rhim,** and the **Assistant Director, Dr. Zhiqiang Zou,** five Senior Investigators, a Laboratory Manager, Post-Doctoral Fellows, WRAMC Urology Residents, Research Assistants, and USU graduate medical students. The Basic Research Program Team has developed a vigorous long-term research program and unique bio-resources with a team of dedicated researchers to address molecular genetic alterations during the on-set, or the progression of, prostate cancers. *Collaborative efforts between Dr. Srivastava and Colonel Judd Moul, CPDR Director, have led to the integration of basic and clinical research activities at the CPDR.* This allows the rapid translation of basic research discoveries into the clinical arena (e.g., the evaluation of biomarkers for prostate cancer progression and the identification of new targets for therapy). Also, prostate cancer gene discovery efforts, using state-of-the-art global gene expression profiling and positional cloning strategies at the CPDR, are uncovering novel gene alterations in prostate cancer. During 2002, the Basic Research Program produced peer-reviewed papers that have been published in the leading cancer research journals, to include: Cancer Research, Oncogene, Clinical Cancer Research, Molecular Medicine, and the Journal of Biological Chemistry. In addition to CPDR funds, extramural grants from the National Institutes of Health, DoD, and private companies support the CPDR Basic Science Research Program.

Notable highlights during 2002, including unpublished findings, are summarized as follows:

PCGEM1, a novel prostate-specific and prostate cancer-associated gene originally identified by the CPDR researchers as a CaP-associated transcript, remains a continued research focus. CPDR now shows that *PCGEM1* expression is significantly higher in prostate cancer (CaP) cells of African-American men than in Caucasian-Americans, and its expression is also elevated in the high-risk group of patients with a CaP family history. Further, in both LNCaP and NIH3T3 cells, *PCGEM1* overexpression promotes cell proliferation and colony formation. To the knowledge of the CPDR researchers, this is the first observation of a prostate-specific gene with cell growth-promoting function showing elevated expression in African-American CaP patients, the population with the highest CaP incidence. What makes these findings significant outside of the cancer research field is that *PCGEM1* is a non-coding RNA gene.

In a recent report in [Cancer Research 2002](#), CPDR researchers provided first insights into the function of *HEPSIN* in prostate cancer cells - one of the most common gene expression alterations reported in CaP. The CPDR laboratory has undertaken functional characterization of *HEPSIN* in prostate cancer cells to understand the biology and role of *HEPSIN* in prostate tumorigenesis. The CPDR demonstrated that *HEPSIN* inhibits prostate cancer cell growth and cell invasion and it may exert its function through cell cycle arrest and induction of cell apoptosis. Studies also provide molecular explanation underlying observations showing decreased or absent *HEPSIN* expression in prostate cancer progression.

PMEPA1, an androgen-regulated NEDD4 binding protein, exhibits cell growth inhibitory function and decreased expression during prostate cancer progression. Serial Analysis of Gene Expression in androgen-treated LNCaP prostate cancer cells has led to the discovery of a novel androgen-regulated gene, *PMEPA1*. CPDR demonstrated that expression of *PMEPA1* in prostate cancer cells resulted in significant cell growth inhibition. Expression of *PMEPA1* decreased in human prostate cancer; and, decreased *PMEPA1* expression is significantly associated with a higher pathologic stage and higher levels of serum PSA, suggesting that decreased *PMEPA1* function may have some role in prostate tumorigenesis.

Scientists at the CPDR are also focusing on continuing work in the areas of definition of androgen signaling in CaP. Expression profiling of androgen-regulated genes by SAGE and Gene Chips has defined endoplasmic reticulum (ER) stress response pathways as a novel component of androgen signaling in CaP cells. This new discovery has the potential to define how male hormones may promote prostate cancer under certain physiologic functions. This report was recently published in the December 2002 issue of [Oncogene](#).

In line with studies that have evaluated the molecular biology of androgen signaling in prostate cancer, CPDR researchers are evaluating the functional consequences of defects of the androgen receptor. Androgen receptor (AR), a member of the nuclear steroid receptor transcription factor, plays key roles in the proliferation as well as the differentiation of prostate glands. Mutations of the AR (mtAR) gene studied during androgen ablation therapy, or during the natural progression of prostate cancer (CaP), are believed to contribute to the progression of androgen refractory CaP. These, and subsequent findings, provide novel insights into the role of AR mutations in prostate cancer. In addition, a novel gene, *DERPC* (Decreased Expression in Renal and Prostate Cancer), was identified. Expression of *DERPC* has inhibitory potential on prostate cancer cell growth. Further, overexpression of *DERPC* in LNCaP cells caused alterations of nuclear morphology. This study suggests that decreased expression of *DERPC* may potentially be implicated in the tumorigenesis of renal and prostate cancers.

CPDR has also continued its groundbreaking research in developing molecular technologies aimed at better diagnosis and staging of prostate cancer of circulating prostate epithelial cells by quantitative analysis of PSA expression. This appears to have potential in prostate cancer diagnosis as well as prognosis. During 2002, CPDR researchers also launched an exciting project to use the newly developed SELDI technology (Surface Enhanced Laser Desorption/Ionization Time of Flight Mass Spectroscopy) for the early detection of prostate cancer by serum protein profiling. The initial study has obtained a sensitivity of 85 percent, specificity of 85 percent, and a positive predictive value of 93 percent for the detection of prostate cancer cells. These preliminary findings support recent and significant observations that complex protein profiles have promising potential in the early detection of prostate cancer and warrant future studies with streamlined technology.

Prostate Cell Center of the Basic Science Research Program. The Prostate Cell Center of the Basic Science Research Program is under the direction of **Dr. Johng S. Rhim, Associate Scientific Director, CPDR, and Research Professor, USU SOM Department of Surgery.** The Prostate Cell Center continues to facilitate studies of new prostate cell lines. Established in January of 2000, in the renovated CPDR laboratory at the USU SOM Department of Surgery, Dr. Rhim and his team continue working towards the Center's goal, which is the generation and characterization of cell lines from primary tumors of prostate cancer patients as well as from normal prostate tissues of the same patients. This also includes cell lines from familial prostate cancer patients. *The Prostate Cell Center also serves as a resource center to provide primary cell cultures of epithelial cells derived from normal and malignant prostatic tissues to the larger scientific research community.* The availability of these cell cultures, as well as derived materials such as RNA, DNA, proteins and conditioned media, facilitates research by other investigators who do not have the means to establish primary cultures themselves. During 2002, Dr. Rhim and his colleagues from the CPDR reported the discovery and characterization of two new prostate cancer cell lines in two leading cancer journals, Cancer Research and Oncogene.

Education and Training. The CPDR fosters training and educational programs to raise public awareness on prostate disease. It sponsors the *US TOO, Inc.*, a patient support group at WRAMC, which holds monthly meetings, small group, and individual counseling sessions where patients' concerns and questions about prostate disease are addressed. The US TOO, Inc. Quarterly Newsletter is also distributed to over 2000 individuals and is published on the CPDR web site, which can be found at <www.cpd.org>. The newsletter lists information about medications and clinical trials as well as names and phone numbers of peer counselors who are willing to listen and tell about their own experiences.

In addition, CPDR is actively involved in the education and training of medical students, uniformed residents, and USU Ph.D. students. The CPDR also provides molecular biology education and training for military urology residents and medical and graduate students from USU. Various internships in the Basic Science Laboratory and the Multi-Center Database are also available to qualified local high school and university students who are interested in careers in the cancer research field.

The CPDR Administration and Staff. The CPDR administration and staff is currently comprised of over 80 researchers and support staff located at USU, AFIP, the Rockville, Maryland CPDR site, and nine participating military medical sites throughout the Nation. The synergism of this professional team of principal investigators, clinical and laboratory researchers, and administrative and scientific support staff has enabled the CPDR to produce cutting-edge quality prostate cancer research. This dynamic program will continue to focus on improving the treatment and detection methods for prostate disease in the military community. The ultimate goal is to improve the health care of all American men suffering from this *silent killer*, which affects one, out of every five men, at sometime in his lifetime. More information is available on the CPDR web site at <www.cpd.org>.

The United States Military Cancer Institute.

Background/Organization. The United States Military Cancer Institute (USMCI) is a component of USU; the Director of the Institute reports directly to the President of the University. In addition to the USU SOM, other components of the USMCI are the Walter Reed Army Medical Center, the National Naval Medical Center, the Malcolm Grow Air Force Medical Center, the Armed Forces Institute of Pathology, and the Armed Forces Radiobiology Research Institute. The Institute has, as its objective, the enhancement of multi-disciplinary cancer research under the USU aegis; the ultimate goals are to advance the science of cancer prevention, diagnosis, treatment, and research. **John F. Potter, MD, former Director of the Lombardi Cancer Center at Georgetown University, and Professor of Surgery at USU,** serves as the Director of the USMCI. Doctor Potter is also the Department of Defense Representative to the National Dialogue on Cancer, an entity that brings together leaders in the National Cancer Community from academia, government and industry.

Mission. The mission of the United States Military Cancer Institute is to promote collaborations among DoD basic and clinical scientists to augment cancer-related patient care and research activities. Significant numbers of DoD beneficiaries have been afflicted by cancer in the past 14 years. Basic scientists at USU are contributing significantly to translational cancer research with clinicians at the local military hospitals.

Benefits of the Cancer Institute. Cancer remains a very significant issue for the DoD beneficiaries in the Military Health System (MHS). Last year, more than 630,000 patients were treated for oncologic conditions; annual costs for cancer care in the MHS are estimated at \$550 million.

There are a number of benefits that will result from the establishment of the USMCI. The USMCI will further enhance the academic prestige of USU and would position the University among the premier academic entities in the Nation. As a consequence, student applications to USU would be increased. Medical and nursing students will benefit from their involvement in multi-disciplinary patient care, which is the hallmark of state-of-the-art cancer treatment. The Institute will enhance the collaborative relationships among cancer scientists in both the basic and clinical areas. The increased public awareness of the high quality of care provided to cancer patients in military treatment facilities should increase the flow of patients to military treatment centers. Post-graduate education must also have large numbers of patients for teaching purposes. This level is being threatened in some hospitals. The USMCI will increase patient accessions to the military treatment facilities. Moreover, these cancer patients present extremely challenging surgical and medical conditions. Caring for such patients maintains and enhances the skills of staff physicians, residents, medical students, and nurses. A cancer institute will stimulate the submission of grant applications to the National Institute of Health and other such academic entities. An increase in grant awards would be a clear indication of the high quality of research being conducted at the University. The Institute could also serve as a model for TriService collaboration.

The United States Military Cancer Institute has been accepted as a member of the Association of American Cancer Institutes. This Association, to which all of the leading cancer centers in this country belong, has established rigid guidelines for admission. These include the performance of high quality basic, translational, and clinical research. The Association reviewed the extensive

documentation, which it requires, describing the USMCI research programs before voting for acceptance. This recognition is a tribute to the quality of USMCI research and patient care activities.

- The Weekly Activities Report, Uniformed Services University Military Cancer Institute Recognized, Health Affairs, Office of the Secretary of Defense, September 3-7, 2002.

Achievements of the Institute. Since its inception, the Institute has accepted 85 candidates as members. These basic and clinical scientists have formed TriService, multi-disciplinary research teams and programs. For example, the USMCI member programs now include the Center for Prostate Disease Research, the Clinical Breast Care Project, and the Cancer Vaccine Development Laboratory. Other programs focus on soft-tissue sarcoma and gynecologic oncology. A Committee of Scientific Advisors, composed of nationally distinguished cancer scientists, meets annually to review the progress of the Institute. At its most recent meeting, the Committee declared that it was impressed with the progress of the Institute and expressed renewed support for the focus of the Institute on cancer prevention and control. This theme was adopted because it will capitalize on the talents of the basic scientists of the USU SOM to conduct translational research with clinicians in the local military hospitals. Also, the wellness concept is important for DoD's strategic goal on medical readiness. To achieve these goals, a nationally prominent epidemiologist has been recruited as the Associate Director for Epidemiology, Prevention and Control.

Services Sign Memorandum to Combine Efforts in Cancer Research. The Commanders of four local military health care facilities signed a Memorandum of Understanding in February of 2002, to create the first TriService Institutional Review Board for the United States Military Cancer Institute. In the past, the necessity for an investigator to obtain Institutional Review Board (IRB) approval from each institution at which the investigator wished to perform research (which often amounted to the completion of approval processes with four or five entities) served as a substantial roadblock to collaborative research. However, the signing of an agreement by the Commanders from the Walter Reed Army Medical Center, the National Naval Medical Center, the Malcolm Grow Medical Center, and the President of USU will enable researchers to obtain the required reviews of their research protocols through a more streamlined process. Instead of being required to submit a protocol to the IRB sponsored by each individual institution, a researcher can now make one submission to one *integrated* Institutional Review Board. This will facilitate the work of the investigators and expedite cutting-edge discoveries and technology for the DoD communities.

Establishment of the USMCI Committee. A USMCI Committee has been established to support and advise the United States Military Cancer Institute. **The Honorable Frank Carlucci, former Secretary of Defense and National Security Advisor to the President of the United States**, serves as the Committee Chair. Other members include **The First Lady of the United States, Mrs. Laura Bush; Ms. Ellen Stoval, President and CEO of the National Coalition for Cancer Survivorship; Mrs. Marlene Malek, President of Friends of Cancer Research; Doctor Jeong Kim, Chairman of CIBERNET Corporation; General H. Norman Schwarzkopf, USA, Retired; and, Mr. Gerald S.J. Cassidy, President of Cassidy and Associates.**

Congressional Recognition. The Congress of the United States has both recognized the United States Military Cancer Institute and mandated substantial funding for its operations during Fiscal Years 2002 and 2003.

The TriService Nursing Research Program - A Joint Program Under the Leadership of the Chief of the Army Nurse Corps and the Directors of the Navy and the Air Force Nurse Corps.

Background. The TriService Nursing Research Program (TSNRP) is a Congressionally authorized program targeted to support research conducted by military nurses (S.R. 107-732). In 1996, the TriService Nursing Research Program was authorized by Congress as part of the DoD Health Care Program and established at the Uniformed Services University of the Health Sciences (Chapter 104, Title 10, U.S. Code, as amended). The TSNRP is under the leadership of the Chief of the Army Nurse Corps and the Directors of the Navy and the Air Force Nurse Corps. The continuing investment of resources and support from the Congress for military nursing research has begun to yield valuable results as uniformed nurse investigators have begun to expand the scientific foundation for military nursing.

The TSNRP's first Director was appointed in 1997, to coordinate and implement all aspects of the program and to manage the day-to-day operations of the TSNRP. Also during 1997, the TSNRP established the Resource Center for Excellence in Military Nursing (Resource Center) to provide resources for nurse clinicians, nurse researchers, and policy makers in support of military nursing research. The major goals of the Resource Center, reestablished during 2001, include the following:

- Provide military nurse researchers with a repository of information for use in designing, implementing, and disseminating nursing research;
- Improve the quality and quantity of proposals submitted by military nurse clinicians;
- Facilitate the implementation of research findings into clinical practice; and,
- Promote the timely dissemination of TSNRP-funded research findings.

Mission. During 2001, the TriService Nursing Research Program re-defined its mission: to provide resources for the conduct and use of research to foster excellence in military nursing care. To achieve its mission, four goals were identified:

- 1) Increase the military nursing research capacity by providing opportunities for nurses to engage in military nursing research;
- 2) Expand the breadth and depth of the nursing research portfolio by encouraging and funding programs of research in TSNRP's focused areas of investigation: *deployment health; developing and sustaining competencies; recruitment and retention of the workforce; clinical resource management; military clinical practice; and, outcomes management;*
- 3) Develop partnerships for collaborative research among the Services, components, institutions, disciplines and agencies; and,
- 4) Build an infrastructure to stimulate and support military nursing research to provide resources for supporting the exploration of salient military nursing research issues.

The TSNRP has designated five areas of research: 1) Deployment Health; 2) Developing and Sustaining Competencies; 3) Recruitment and Retention of the Work Force; 4) Clinical Resource Management; and, 5) Military Clinical Practice and Outcomes Management. Each of these areas can provide valuable clinical outcomes to enhance the care delivery systems for soldiers, sailors, airmen, and their families.

With a redefined mission, identified goals and strategies, and the Resource Center for Excellence in Military Nursing firmly established, the TSNRP offers military nurse researchers a full spectrum of services that will ultimately improve the ability of military nurses to provide appropriate, high quality health care for the Armed Forces.

Highlights of TSNRP Activities During 2002.

General Program Activities.

United States Senator Recognized for Significant Support of Military Nursing. **United States Senator Daniel K. Inouye of Hawaii** has been instrumental in all Congressional appropriations for the TSNRP. In collaboration with the Army, Air Force, and Navy Nurse Corps, the TSNRP honored Senator Inouye for his support of military nursing and military nursing research during 2002. In a videotaped ceremony held in the Senator's office, **Brigadier General Barbara Brannon, USAF; Brigadier General William Bester, USA;** and, **Rear Admiral Nancy Lescavage, USN**, presented a crystal award etched with the three Nurse Corps insignias to the Senator. Senator Inouye's on-going support for nursing and nursing research was again recognized during the 2002 State of the Science Congress held on September 26-28, 2002, in Washington, D.C.; the event was attended by over 900 national and international nursing leaders and prominent nurse scientists. In the videotape, described above, which was shown during the opening ceremonies of the State of the Science Congress, Senator Inouye explained that the origin of his support for military nursing extended back to his hospitalization and recuperation from injuries he sustained during World War II. The Senator's words had a significant impact on the audience as one nurse researcher from Montana later stated that she finally understood why her father had carried a photo of his military nurse in his wallet for decades to show his sincere gratitude after he had recuperated from injuries received during World War II.

Professional Senate Staff Recognized for Support of Military Research. **Patrick DeLeon, Ph.D., J.D., Chief of Staff, Office of Senator Inouye, the United States Senate**, was recognized and honored for his support of military nursing research at the 2002 Phyllis J. Verhonick Nursing Research Course held in San Antonio, Texas. Doctor DeLeon was the keynote speaker at the research course; he spoke of the value of nursing research and its important contributions toward evidence-based nursing practice.

The TSNRP Strategic Refinement Conference. TSNRP sponsored a Strategic Refinement Conference in August of 2002, which was attended by nurse researchers, policy makers, clinicians, and research consultants from each of the Services, the TSNRP Advisory Council, and the TSNRP Director and staff. The goals of the conference were twofold: to obtain the participants' perspectives on current research issues and concerns; and, to

refine the TSNRP Strategic Plan based on current research issues. Through guided facilitation, the consensus of the participants reflected as follows:

- In the more than 18 months since the goals and specific strategies were first established for the program, the TSNRP has remained on target and has made significant progress in achieving its goals;
- The focus and quality of the TSNRP-funded research have been facilitated through the TSNRP's on-going discourse with investigators and diligent monitoring of research progress;
- The application review process, both scientific and programmatic, has been strengthened, resulting in rigorous research protocols; and,
- Open communication and collaboration between and among the TSNRP, the military nurse researchers, and the Nurse Corps leadership is resulting in a greater appreciation for, and utilization of, the research process.

Five initiatives were identified by the group as areas in which to concentrate military nursing research activities: the development of a strong and formal marketing campaign; the mentoring of novice researchers; the funding of small studies; *Grab and Go* operational research; and, continued focus on the TSNRP's deployment-specific research priority.

2002 Testimony Before the Senate Appropriations Committee, Subcommittee on Defense. During 2002, each Nurse Corps Chief and Director, in submitted written testimony for the Subcommittee on Defense, Senate Appropriations Committee, cited the value of the TriService Nursing Research Program to military nursing practice. In his testimony, the Army Nurse Corps Chief, Brigadier General William Bester stated: **support of the TriService Nursing Research Program has resulted in many advances in caring for our Nation's most precious commodity - our soldiers, their family members, and the deserving retiree population.** And, the Air Force Nurse Corps Director, Brigadier General Barbara Brannon testified that: **the continued financial support of the TSNRP enabled us to fund valuable studies on new technologies in the patient care environment and on military nursing practice models.**

Pre-Grant Award Activities.

Regional Research PODs Support the TSNRP. Regional Research PODs, initially created during 2001 through the TSNRP's Resource Center, are located across the United States, to include Hawaii. They are led by Ph.D.-prepared military nurse scientists. The Research PODs aim to: 1) facilitate military nursing research across the Services; 2) provide mentorship to masters-prepared nurse researchers; 3) support programs of nursing research within, and across, the Services and Military Medical Centers; 4) share research resources; 5) foster collegial support for military nurses interested in conducting research; and, 6) facilitate the utilization of research findings in practice. The Southern Research POD updated, and recently implemented, guidelines for ventilator-associated pneumonia in five ICUs at two Medical Treatment Facilities, one Army and one Air Force. The use of

these guidelines should result in a reduction in infection rates, length of stay, and associated costs. The Northwest POD has completed a systemic data collection before implementing evidence-based practice guidelines at four Military Treatment Facilities for maternal child care, which should ultimately result in improvements in patient and systems outcomes.

2002 Grant Writing Camp. The TSNRP Resource Center for Excellence in Military Nursing sponsored a two-phase summer workshop during 2002, to expand the grant-writing skills of military nurse researchers. Phase I included a five-day workshop that featured a balance between lectures, small group discussion, one-on-one sessions with faculty, and homework to support the improvement of the participants' draft proposals. Phase II offered a two-day workshop intended to increase the participants' understanding of the scientific review process through a peer review of the participants' research proposals, to include primary, secondary, and faculty proposal reviews. Comments from the 2002 Grant Writing workshop participants included: **Thank you for this opportunity... This is the most comprehensive information I have had since my doctoral program... The speakers were all wonderful... and, I think the program was perfect... I wish I could attend again for an intellectual jump start.** Four Grant Writing Camp participants subsequently submitted their proposals for Fiscal Year 2003 funding.

New Funding Award Categories. New funding award categories included: the *Research Fellow Award*. This award is intended to facilitate training of military nurses interested in research and the expansion of research skills of experienced military nurse researchers; the *Fast Track Award*. This award is intended to facilitate the rapid implementation of short-term research that responds to Service-specific questions or concerns.

Additional Call for Proposals. The TSNRP announced the addition of an annual late winter call for research proposals. This second call for proposals will extend the opportunities for funding to better meet the needs of the increasingly mobile military nurse researchers, whether through change of duty stations, or deployment.

Three-Tiered Proposal Review.

Review for Scientific Merit. All proposals submitted to the TSNRP for funding are subject to rigorous peer review designed to evaluate the scientific merit of the research proposals. Nurse scientists selected from the health care community for their research experience, publications, and work experience, comprise the review panel. Military reviewers evaluate the proposals for the feasibility of implementing the research in a military environment.

Review for Programmatic Merit. Following the scientific merit review, the TSNRP Advisory Council, comprised of one representative from both the Active Duty and Reserve Components from each branch of the military Services, conducts a programmatic review. Council members assess the likelihood that the proposed research will meet TSNRP goals and objectives.

Awarding of Grants. Final funding decisions are based on scientific and programmatic evaluations; grant awards are made by the TSNRP Executive Board of Directors, the Corps Chief, and Directors of the three Nurse Corps.

Grant Award Activities.

Grant Management Workshop. Since 1998, the TSNRP has provided a three-day grant management workshop for newly funded principal investigators; and, since 2001, project directors. The workshop is designed to provide education on Federal, DoD, and USU regulations and requirements, as well as practical information on managing a research grant. Presentations at the 2002 workshop included didactic sessions, case studies, and small group discussions in areas such as: grant agreement regulations and cost principles; Federal and local institutional review board (IRB) requirements; research integrity; copyright laws; ethics in research; the investigator's role and responsibilities; assistance visits; reporting requirements; and, budget management. The workshop provides an opportunity for investigators to meet the TSNRP staff and to establish a working relationship; it can also be a venue for the investigators to network with other military nurse researchers from their own and other Services. The response to the workshop, which was well received by the TSNRP investigators, was outstandingly enthusiastic.

A Total of 230 Research Proposals Have Been Funded by TSNRP. Since its establishment in 1992, a total of 230 research proposals have been funded by the TSNRP. During Fiscal Year 2002, 17 military nurse researchers received funding in areas including: nursing practice during operations other than war and air evacuation; development of a military nursing outcomes database; quality of life assessment; retention of military nurses; fitness among National Guard personnel; STIs and pregnancy prevention during deployment; psychosocial adaptation to pregnancy; competency skills identification; effect of dopamine on diaphragm fatigue; care coordination for profiled soldiers; military hospital outcomes; educational strategies for chemical warfare; and, musculoskeletal injuries among Army medical department personnel.

Grant Management. Two full-time grant managers provide routine monitoring and timely assistance for over 60 active research grants. Investigators receive assistance from TSNRP grant managers for a myriad of issues, including: requests for changes in research design and study personnel; additional funding and extensions to the study period; disposition of equipment; monitoring and tracking of regulatory compliance and human subject protection training; and, reviewing progress of the research.

The TSNRP Web Site. The TSNRP maintains an active web site, <www.usuhs.mil/tsnrp>, which provides the investigators with current information on opportunities for dissemination; application eligibility, requirements and forms; previously funded TSNRP research and findings; references and links to related web sites; and, Resource Center activities. More than 11,000 *hits* have been logged since a counter was placed on the site in early 2002.

Post-Grant Award Activities.

Publication Workshop. The TSNRP Resource Center sponsored a one-day publication workshop following the May 2002 Phyllis J. Verhonick Nursing Research Course in San Antonio, Texas. The workshop featured lectures by two nationally renowned authors and TSNRP-funded investigators and an editor from the *Critical Care Nurse Journal*. Workshop topics included: the importance of publishing; improving writing and editing skills; authorship issues; dealing with rejection; and, targeting the right journal for a manuscript. Participants with manuscript drafts also met with a workshop instructor for one-on-one review and assistance. Three manuscripts from the workshop are currently in review and/or in press with various publishers.

Dissemination of Research Findings.

Publications. During 2002, 15 publications from TSNRP-funded research appeared in peer-reviewed journals, which included: the *American Journal of Epidemiology*; *Biological Research for Nursing*; the *Journal of the American Psychiatric Nurses Association*; the *Journal of Clinical Psychology*; the *Journal of General Internal Medicine*; the *Journal of Social Behavior and Personality*; the *Journal of Nursing Administration*; the *Journal of Nursing Scholarship*; *Obstetrics and Gynecology*; *Oncology Nursing Forum*; *Nursing Administrative Quarterly*; and, the *Nursing Ethics Journal*.

Poster Presentations. More than 40 papers and posters of TSNRP-funded research were presented at major research and clinical conferences throughout the United States and abroad, to include: the *12th Biennial Phyllis J. Verhonick Nursing Research Course* held at San Antonio, Texas; the *108th Meeting of the Association of Military Surgeons of the United States (AMSUS)* held in Louisville, Kentucky; the *Karen Reider Poster Session, AMSUS*, in Louisville, Kentucky; the *State of the Science Congress* held in Washington, D.C.; the *Southern Nursing Research Society* in San Antonio, Texas; the *American Heart Association* in Chicago, Illinois; the *Aerospace Medical Association* in Toronto, Canada; the *15th Annual Pacific Nursing Research Conference* in Honolulu, Hawaii; the *Academy of Health Services Research* in Washington, D.C.; and, the *Uniformed Nurse Practitioner Association for Research Competition* held in Reno, Nevada.

Research Utilization/Evidence-Based Practice. The TSNRP, through the Resource Center's Regional PODs, supports the integration of research utilization and evidence-based practice into nursing practice. To that end, the Resource Center sponsored a one-day workshop, *A Model of Evidence-Based Practice in Clinical Practice Setting*, held in June of 2002, at the Naval Hospital in Portsmouth, Virginia, and again at the National Naval Medical Center in Bethesda, Maryland. The workshop was in collaboration with the Walter Reed Army Medical Center in Washington, D.C. Doctor Marita Titler, nationally and internationally recognized for her expertise in research utilization, provided participants with fundamental concepts of research utilization as well as practical tips for instituting Research Utilization Programs in Medical Treatment Facilities. Participants at both workshops represented clinicians, researchers, and nursing leaders from the Army, Navy and Air Force. These workshops, combined with the support of the Research PODs, have stimulated a grass roots movement among military clinicians, educators, and middle managers to reevaluate what ultimately results in the highest quality of nursing care for military beneficiaries.

Future Direction. The future of military nursing research is largely in the control of the military nursing community. *Advancing the practice of military nursing and its response to the requirements of military readiness and deployment remains both the mission and the priority of military nursing research.* The TriService Nursing Research Program serves as a catalyst for stimulating the synergistic endeavors between the three military nursing Services in both the Active and Reserve Components, to advance the science of military nursing. For the Year 2003 and beyond, the TriService Nursing Research Program *stands ready* to support those endeavors.
